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OCTOBER, 1959

THE AIR LINE PILOT

UNIVERSITY OF ILLINOIS
OCT 20 1959

In This Issue

"The Quick Or The Dead"

Air Mail — Past And Present

Special Report On Retirement Question

Pilot's Capability vs. Work Load

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THE AIR LINE PILOT

OCTOBER, 1959
Vol. 28, No. 10

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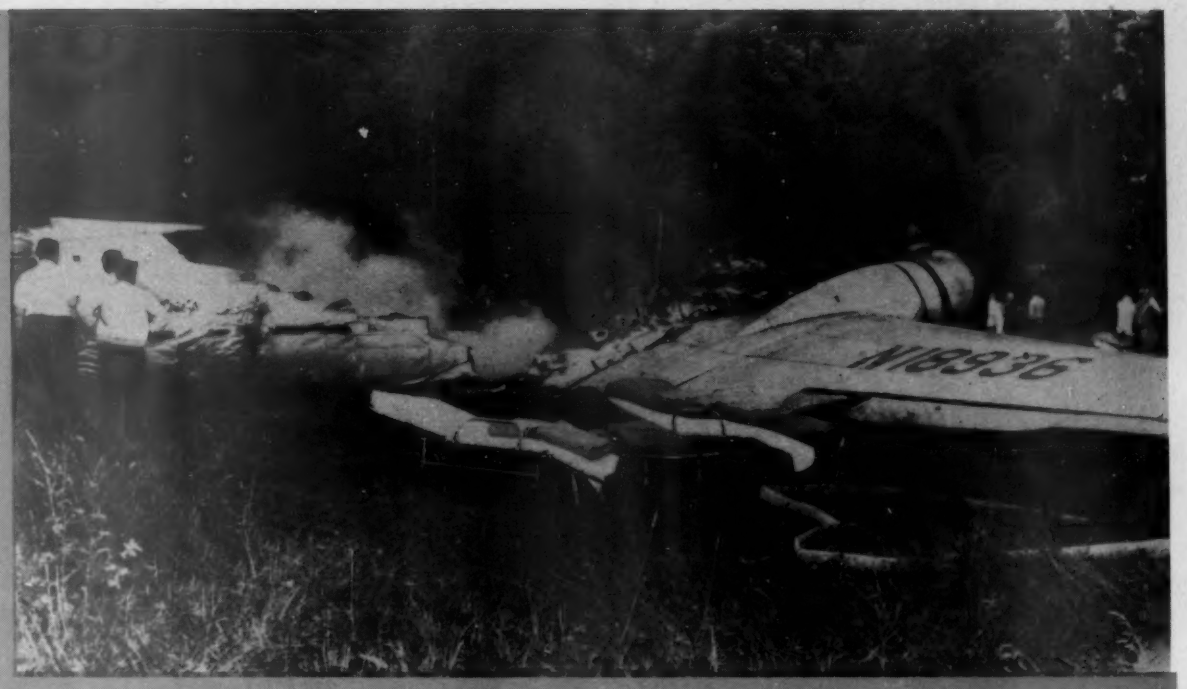
On The Cover

THE ceremonies inaugurating coast-to-coast DC-8 Jet Mainliner service by United Airlines in September, were held indoors at San Francisco because of inclement weather which failed, however, to dampen participants' spirits. Shown from the left are Governor E. G. (Pat) Brown of California; Stewardess Betty Myers; Mrs. W. A. Patterson, who gave the new jetliner its official send-off to New York, and W. A. Patterson, United's President. Delta Airlines also started DC-8 flights last month.

The new jet is in the 575-600 m.p.h. class and costs approximately 5 million dollars. Dimensions are length, 150 ft., 6 in.; wingspan, 139 ft., 9 in.; height, 42 ft., 4 in.

"... The Quick



Or The Dead"

By Bill Collier

Chairman, ALPA Fire Control Committee

MARCH 13, 1954, was a beautiful day at Kallang airport; perfect flying weather. The flight crew in the Connie about to land were glad to have no problems because they were tired after almost 24 hours aboard. The captain lined up easily for a normal landing. The approach over the threshold was a bit low, and the right main landing gear struck a small concreted drainage channel running across the end of the runway. The right gear collapsed, and the right wing dug in and broke off. The aircraft continued sliding, spilling fuel from the ruptured tanks. It came to rest on the right side, with the left wing sticking up in the air. The fuselage remained intact. Vertically, the impact had not been hard.

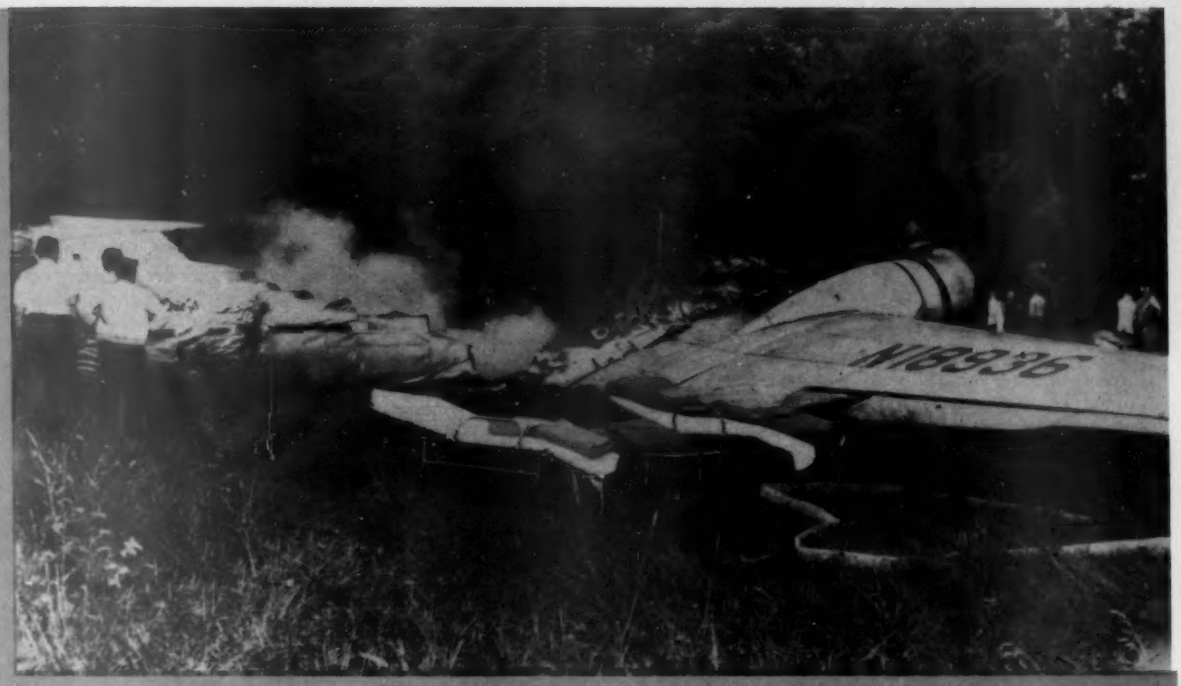
A few incipient fires started—the kind that a modern crash truck with an alert, well-trained crew could have immediately contained without any fatalities to those aboard. But no such equipment was available. Rescue and fire fighting equipment was too old and inadequate for aircraft the size of the Connie. The fire department was disorganized, the crews did not even know how to use their obsolete equipment effectively, and no one knew where or how the emergency exits opened, or even where or how to chop into the fuselage. Eventually the incipient fires became a conflagration, and instead of a no-fatality accident, 33 human beings burned to death. The Kallang accident developed into one of the most disastrous penalties of negligence in the history of air tranportation.

This dramatic accident in which 33 lives were needlessly lost shocked the British Air Ministry as well as the aviation world generally. Gears started turning that were almost rusty from disuse. There was a stir of activity among organizations concerned with air safety. This glaring example of the abrogation of safety eventually proved to be the catalyst that brought together representatives from all over the world to sit down and work together in a common cause. Again, as happens all too often it took the sudden and dramatic loss of human lives to bring an air safety problem into focus.

While interest was set off by the Kallang accident, the problem itself, of course, was not unrecognized nor new. The Air Line Pilots Association had already been working on the problem for years. Even prior to 1950 Vic Hewes (Delta) of the ALPA Fire Control Committee had been studying and working on the problem. Working with equipment manufacturers he conducted studies to find out what the airports needed and could buy. He studied the National Fire Protection Association recommendations and worked with airport and civic officials to try to convince them of the need. The job was not easy. In at least one instance, he felt the wrath of city officials stung by revelations in the local press of inadequate rescue and fire fighting equipment at one of our prominent airports.

Vernon Brown (American) gave several years of his spare time to the problem of in-flight fires. He successfully led the fight for reliable airborne

"... The Quick



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fire detection systems and in-flight checks of these systems. He worked for better extinguishing systems for all types of in-flight fires, coordinating his work with those working on the ground fire control problems.

An International Problem

The international scope of the problem was brought to my attention in 1952 when, as the Council 61 (PAA) Engineering & Air Safety Chairman, a routine check into all aspects of air safety in the Central American operations of PAA was being performed. Exploration of the problem was conducted by a survey of existing rescue and fire fighting equipment at each airport. Acute shortages of equipment and personnel were found to exist. In some cases, only hand extinguishers were available at airports with many daily movements of two and four engine airline equipment.

At the 1953 meeting of the Central Air Safety Committee of PAA, a system sub-committee was formed to investigate the problem internationally on a large scale. A survey which took a year to complete was begun and it provided information concerning existing rescue and fire fighting equipment at 154 airports throughout the world then served by PAA. It was while this survey was underway that the tragedy at Kallang occurred, focusing international attention on the problem.

The National Fire Prevention Association had also been active on the problem. This organization is recognized as the outstanding authority on fire prevention and control. It was organized in 1896 as a non-profit organization to promote the science and improve the methods of fire protection and prevention, to obtain and circulate information on these subjects and to secure the cooperation of its members in establishing proper safeguards against loss of life and property by fire.

Its membership includes 200 national and regional societies and associations and 17,000 individuals, corporations and organizations. ALPA has been a member and has actively participated on the NFPA Aviation Committee for many years.

The NFPA first entered the crash-fire picture in 1947 when they formed a committee to study the problem. Since then, it has published many bulletins designed to serve as guides for aircraft rescue and fire fighting services for airports, training of fire-fighting personnel, and suggested specifications for equipment. Committee work leading to the development of these recommendations commenced in 1947 following a request from the Civil Aeronautics Board for information as to what constituted adequate ground fire fighting equipment and personnel for airports served by scheduled air carrier aircraft.

After more than two years of work, the NFPA Aviation Committee adopted a tentative text of recommendations.[1] However, at this time, representatives of the Airport Operators Council and the American Association of Airport Executives presented formal resolutions objecting to the text. Subsequently, further meetings were held during which time the airport management groups were asked to participate and in 1951 a revised text was unanimously adopted.

In 1947, a working party organized under the auspices of the International Civil Aviation Organization had also met in Montreal and drafted a paper on the subject.

This was the background of the problem and the major efforts toward its solution which had been made prior to the Kallang accident.

The British Air Line Pilots Association was very concerned as a result of the Kallang accident and the International Federation of Air Line Pilots Associations became active on the problem. They combined the previously mentioned PAA system survey with information of their own to form the basis of a request that the problem be placed under study by the International Civil Aviation Organization. The United Kingdom made a formal request (under ICAO rules neither IFALPA nor IATA can do so) that ICAO study the problem with a view toward mutual solution. As a result, an international panel was chosen to study the problem.

International Panel

Initially, this study was conducted by correspondence which was collated and monitored by the Secretary General of ICAO. After about a year during which different viewpoints were liberally exchanged, a meeting of the panel was held in December, 1956, at Montreal to develop guidance material on the subject in concrete form to be presented to ICAO for processing. Many countries sent experts to help in the preparation of the material. (Editor's Note: The author was IFALPAs' representative and Vic Hewes helped part of the time.) There were several representatives from the U. S. with George Tryon of the Aviation Committee of the National Fire Prevention Association serving as their technical expert.

At Montreal, the Technical Panel of Experts drew up a 53-page technical document developed from material presented by various contracting states and member organizations. This document showed the scope of the problem and contained recommendations and specifications for adequate rescue and fire fighting equipment and personnel and their training. A table accompanying the text showed scales of equipment which were associated with weight categories of aircraft, with a further consideration as to movements per day of each category of aircraft. In essence, ICAO's technical recommendations are similar in format and context to the proposals presented by the U. S., which, in turn, were based on the NFPA's "Suggestions for Aircraft Rescue and Fire Fighting Services for Airports and Heliports" (NFPA No. 403).

The material prepared by IFALPA helped considerably in presenting the pilots' viewpoint. As a result, the final document included several major pilot-sponsored objectives. The most important of these objectives was the recommendation that each airport have a light, fast rescue vehicle, with two-way radio, regardless of how much other equipment they might provide. Another objective of equal importance was a statement in the introduction to the document that the contracting state government should recognize and accept the responsibility for ensuring that the recommended scales of equipment be provided at all regular and alternate airports served by international air services.

This technical document was then passed on for processing through the ICAO procedures. The first body to pass on the material and recommend its status[2] was the Air Routes and Ground Aids Division (AGA) of ICAO.

At its sixth meeting, March 12-April 16, 1957, the AGA Division, after prolonged debate and opposition by the U. S. and a few others, finally agreed by majority vote to recommend that two recommendations be given the status of RECOMMENDED PRACTICE. These were:

1. NFPA 403.

2. "Status" is the ICAO method of classification of importance of documents to be made a part of any Annex, which is the published agreement between the Contracting States comprising ICAO concerning the various areas or divisions of international air commerce. For instance, the Annex 14, "Aerodromes," is concerned with all the physical properties; approach aids, lighting, runway markings, overrun and obstruction areas, rescue and fire fighting protection, etc., of aerodromes used in international air commerce. Material comprising an Annex must have one of the following defined designations as to status:

▸ Rescue and fire fighting equipment and services should be provided at regular and alternate aerodromes used by international air services. For this purpose contracting states may, if appropriate, designate public or private organizations suitably located and equipped for giving prompt fire fighting and rescue assistance at the scene of an accident on or near aerodromes open to international air services and define the function of those organizations.

▸ Where local public or private organizations are not available contracting states should use their best endeavors to ensure that equipment and organizations suitable for the purpose are provided.

Guidance on rescue and fire fighting equipment. and services made an Attachment.

This material was then passed on to the ICAO Air Navigation Commission, which, after due deliberation and slight modification, passed the finalized document to the General Council for action. Finally, on May 12, 1958, ICAO General Council approved the status as recommended. The voting record of the Contracting States showed two abstentions. The U. S. voted against, the balance of the states voted for the proposal.

At the 13th Annual IFALPA Conference, held in Bogota in 1958, a new IFALPA survey of representative airports was instituted. One purpose of the survey was to determine the extent of improvement during the prolonged period of effort by IFALPA. Since the status of the bulk of material presented to ICAO was finally classified as Guidance Material, only two statements previously quoted being classified as a Recommended Practice, it was felt that contracting states might not make "every endeavor" to see that protection was provided.

Comparison of the IFALPA survey with previous information showed that substantial improvement has been made at most international airports included in the survey. At the Helsinki Conference in May, 1959, IFALPA decided to request each member organization to work on the problem individually in each country, the feeling being that world-wide group action could be deferred for the time being due to substantial improvements in many countries.

From the pilots' standpoint, this, of course, places an immense job before ALPA. Although the U. S. is the prime user of aviation, as a nation, it lags far behind many countries in the provision of airport fire protection.

Part of the immensity of the problem is the divergent viewpoint of all agencies involved — the government, the airport operators, the air carriers.

▸ **The U. S. Government** has consistently declined national regulation and ICAO agreement in this area of air safety for a variety of reasons. Although the CAA/FAA has long recognized the need and encouraged airport management to provide equipment, because of the more than 5,000 public airports in the U. S., the financial burden of providing adequate rescue and fire fighting personnel and equipment at all these airports is staggering. Certainly, the federal government has no intention of getting into the fire fighting business on such a scale—especially so since the only federally owned and operated airport is Washington National. The political implications attendant to federal aid in substantial amounts to airport managements for such purposes have been strong enough to deter any movement in this direction. Other contracting states of ICAO are not faced with such a staggering financial problem. While it is true their airports are federally operated, each country has so few public airports that the financial problem is not so great as to be almost insurmountable

▸ **Airport management** has, on the other hand, in most cases been very reluctant to make expenditures for such protection, arguing that their profits are already too small. If they must provide such protective services, they say, not only must federal or state aid be forthcoming, but also larger fees from the airlines.

▸ **Air line management** has, in turn, with one exception, virtually ignored the whole problem. In most cases they resent the problem even being mentioned because it points up a vulnerable area in air safety. They know that ultimately part of the cost must be passed on to them and they say profits are already exceedingly low or nonexistent. Because of possible injury suits, most of them are afraid to allow their personnel to act as auxiliary firemen.

Because of the immensity of the airport fire-fighting problem in the U. S. which is additionally complicated by the divergent opinions and self-interest of the various agencies, it is clear that special efforts requiring a great degree of leadership on the part of ALPA and the pilots will be required if the problem is to be satisfactorily solved.

Last August the ALPA Fire Control Committee, in conjunction with the Home Office Engineering and Air Safety Department drafted and sent to the FAA a proposed Technical Standard Order for "Aircraft Rescue and Fire Fighting Services for Airports used for Scheduled Air Carrier Operations."

This is where matters rest at present, but as the result of past activity both nationally and internationally, we now have tools with which to work.

If these tools are to produce effective results, however, this is what will be required:

▸ **Compliance** by the federal government with the ICAO recommendations to which other contracting states bound themselves by vote. This can be accomplished by the U. S. "Making every endeavor" to see that adequate rescue and fire-fighting services are provided at all **International Airports.**

▸ **Adoption** of the ALPA proposed TSO on the subject to insure that **all** airports used in scheduled air carrier operations are protected.

▸ **Unity** among the various organizations whose help is needed to achieve these aims and who, in the final analysis, are the ones who stand to profit by the improved level of safety which will result.

The accident at Kallang which precipitated considerable interest in this problem clearly illustrates one extreme —that lack of proper fire fighting equipment and procedures results in tragedy. The Seaboard & Western-Capital accident at IDL in November last year illustrates the other extreme —how good, effective rescue measures can be performed in a minimum of time. NACA statistics show that time is all important, if lives are to be saved.

ALPA hopes the federal government, the air lines, and the airport operators will unite with it in efforts to achieve adequate fire protection for the man who is really paying for our whole show—namely, Mr. Public. Believe me, in the opinion of those who have been extremely close to the subject, one fact stands starkly out: It's either "The Quick or the Dead."

(a) "STANDARD: Any specification for the physical characteristics, configuration, material, performance, personnel or procedure, the uniform application of which is recognized as necessary for the safety or regularity of international air navigation and to which Contracting States will conform in accordance with the Convention; in the event of impossibility of compliance, notification to the Council is compulsory under Article 38"; (b) "RECOMMENDED PRACTICE: Any specification for physical characteristics, configuration, material, performance, personnel or procedure, the uniform application of which is recognized as desirable in the interest of safety, regularity or efficiency of international air navigation, and to which Contracting States will endeavor to conform in accordance with the Convention"; (c) "GUIDANCE MATERIAL: Any and all material published and issues to Contracting States for information purposes only." It is usually made an attachment to an Annex only in event explicit reference is made to it in the text of the Annex.

"NEITHER RAIN NOR SNOW..."

1918

1927

Development Of Mail-By-Air Postal Concepts

ARE the American people entitled to the fastest and most efficient carriage of mail available?

This was the question posed again this year as the 86th Congress in its first session introduced and considered a bill which would give the Postmaster General the authority to utilize our transportation for the movement of various other classes of mail in addition to air mail.

Although action on this bill was deferred until the next session, the chief aim of the bill was accomplished when it was established for the record that the Post Office does have the authority to use air carriers in this manner without new legislation.

The transition to new ways of carrying mail has happened many times before; every time a faster means of transportation has come along.

Better postal service for the general public and business has always been an American tradition. It began with the Declaration of Independence. Even before the Constitutional Convention (in 1786) the first major improvement was made in conveying mail because a faster way came along. Prior to 1785, postal riders transported the mail. But in that year, the Postmaster General, in legislation similar in principle to the aforementioned introduced this year, was authorized to contract with stage lines to perform that service. There were, to be sure, protests then, as now. When railroad construction was begun, the nation was as prompt, as it had been in the case of the stage, to promote their growth. In 1838, all railroads were made "post routes". A premium was paid, too, for the improved service, but ultimately removed as this became the standard way to haul mail.

It was inevitable that with the development of aviation, the aircraft would take its place in this historic pattern and the commencement of large scale jet operations in 1959 have undoubtedly stimulated further progress in this direction.

Some forecasts have predicted that by 1965, 75 per cent of all mail will be carried by air.

The first steps toward more firmly implanting air transport as the logical, modern way of carrying mail were made in October, 1953 when the first experiments with carrying first class mail by air began on heavy volume mail routes between Chicago, New York and Washington. Then, it was extended to include certain Florida cities; next, to the Pacific Coast; subsequently, to other areas where it was deemed practical. Of these operations the Postmaster General has said: "These operations have proved successful both from the standpoints of speed and economy."

William E. Boeing And Eddie Hubbard Made The First International Air Mail Flight From Vancouver, B. C., To Seattle On March 3, 1919, In This Boeing C-700 Seaplane.

It has taken the airplane forty odd years to attain its present proportions of recognition and utility in the haulage of mail. The air mail story has been one of healthy growth in which determination and faith made possible the breakthrough and final acceptance of air mail into the transportation system. The story is an interesting one of the not so distant past that can still be recalled by some charter members of ALPA and other pilots still flying today. The following account of the history of Air Mail is adapted from a story in Eastern Airlines Magazine *The Great Silver Fleet*. Photographs were reprinted from the Jesse Davidson Air Mail Collection.

It was just 41 years ago that air mail began in the United States. On August 12, 1918, the Post Office Department began flying mail on the Washington - Philadephia - New York route with six pilots and six special built Standard planes. Three months earlier the Army Signal Corps had inaugurated the flights for the Post Office.

The history of those pioneer days is recorded by the Air Mail Pioneers, an organization of former employees of the U. S. Post Office Department's Air Mail Service which operated between August 13, 1918, and August 31, 1927.

The Air Mail Pioneers have chapters in nine cities with about 600 active members. The club was formed in 1942 under the name of "The Last Man Pioneer Air Mail Club" and in 1953 the name was changed to the Air Mail Pioneers. Only those who worked for the Air Mail Service are eligible, hence, the wonderful organization will die with the demise of its last member.

Scotty Tefft, who is president of the Florida Chapter and furnished much of the material for this article from his voluminous files, says the club is constantly working to locate other AMS veterans, automatically members, with whom contact has been lost over the years.

On a September morning in 1911 at a flying field outside Mineola, Long Island, New York, experimental air mail flying was born. There an airplane took off and delivered mail to the Mineola Post Office. For a week mail was successfully carried on flights from the field to the Post Office, and in 1912 the Post Office Department, encouraged by the success of these demonstration flights at Mineola, urged Congress to appropriate money to launch an air mail service. However, the Congress was far from sold on flying machines, preferring to remain on terra firma, and did not appropriate the money.

In 1916, however, Congress made

Northbound: Present For The First Flight Were Otto Prager, An Ass't. Postmaster General (L.) With Merit O. Chance, Washington Postmaster, Albert S. Burleson, Postmaster General, And President Woodrow Wilson (R.). Washington Takeoff Was From Potomac Park.

available for air mail service the lavish sum of $50,000 out of its "steamboat or other power boat service" appropriation. In 1918 $100,000 was appropriated for the establishment of an experimental air mail route. The War Department furnished the planes and the pilots, and commencing May 15th, the mails were flown between Washington and New York City via Philadelphia, a distance of 218 miles.

The experimental air mail service between New York-Philadelphia-Washington launched on May 15, 1918, continued until August 10, 1918. During this time, the planes, Curtiss JN-4H's powered with 150 horsepower Hispano Suiza engines were flown by Army pilots.

Since it was the intention of the Post Office Department to operate the service with the Postal Service's own equipment, an order for six custom-built mail planes was placed with the Standard Aircraft Company of Elizabeth, N. J. These planes, advanced for their day, were powered with the 150 h.p. Hisso engines and had special mail pits located underneath the center sections of the upper wings. Simultaneously, six civilian pilots were hired.

On Monday, August 12, 1918, the Post Office Department began the world's first regular permanent civilian air mail service. Pilot Max Miller was at the controls of the first plane taking off that day with air mail from College Park, Maryland.

The plane left at 11:35 a.m. carrying about 230 pounds of mail; pilot Maurice Newton took over at Philadelphia and landed at Belmont Park race track, New York, at 2:15 p.m. Two other pilots flew the south-bound trip from New York to Washington (College Park terminal) in three hours starting at noon. They were pilots Robert Shank and Edward V. Gardner.

Gill Robb Wilson, the noted aviation publisher, credits much of the initial impetus in the inauguration of air mail service to the late Otto Praeger, often called "the father of air mail." As Assistant Postmaster General from 1915 to 1921, he possessed a long range vision that during the early years of national air policy, contributed immensely to the establishment of commercial aviation. Otto Praeger's goal was not only to foster air commerce by the support promised by an aerial mail service so that private capital ultimately could be attracted to create a new industry, but, also to make the airplane a carrier of mail so that it would be made to measure up to requirements of dependability and regularity which would develop its character. Otto, whose memory is revered by all of the early air mail folks, could not have been more on course. The development of commercial aviation almost exactly paralleled his early thinking.

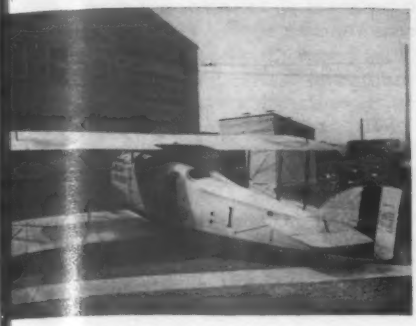
It was air mail requirements which fostered the development of instrument flying, meteorological service, Federal airways, hard surface runways, radio communications and multi-engined airplanes. When the airplane was forced to produce the exacting performance necessary to keep the nervous system of American business and industry flowing smoothly, noted Wilson, it either had to conform or retire from the field. It conformed. But it wasn't as easy as that. There were people, working against great handicaps, who made the machine conform. They were those of the U. S. Air Mail Service.

On May 15, 1919, service was established between Cleveland and Chicago with a stop at Bryan, Ohio; the first step in what later became the first transcontinental route linking New York and San Francisco.

On July 1, operations were extended from Cleveland to New York with a stop at Bellefonte, Pennsylvania. The service performance during that period was remarkable considering that there were no radio facilities, no marked airways or other navigational aids. During 1919, over the three routes in opera-

Southbound: Cheering Crowd Sends The First Flight On Its Way As It Clears The Rail At Belmont Park.

Album of early Air Mail planes



Standard—1918

Curtiss R-4—1919

Martin Mail Plane—1919-20

DH-4—1919-1926

Swallow—1926

Douglas M-2—1926-27

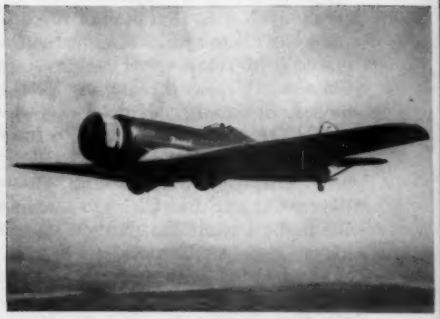
Pitcairn PA-5 Mailwing—1926-27

Ryan Monoplane—1926-27

Boeing 40-B4—1927-30

Pitcairn PA-7—1928-35

Curtiss Carrier Pigeon—1930



Boeing Monomail—1930

Shown Here Are The First Group Of Civilian Air Mail Pilots. (L.-R.) Edward L. Langley, Edward V. Gardner, Capt. Ben B. Lipsner (Supt. Air Mail Service), Maurice Newton, Max Miller, And Robert Shank.

tion, eight planes flew 1,900 route miles daily with a performance record showing more than 95 per cent of scheduled miles completed.

On May 15, 1920, service was extended westward from Chicago to Omaha, Nebraska, and on September 8 from Omaha to San Francisco. The dream of transcontinental air mail service became a reality. Even though planes flew only during daylight hours, air mail bettered cost-to-coast train time by 22 hours.

On February 22, 1921, the first *through* transcontinental mail plane took to the air, a truly great moment for it meant flying the mails through long black, beaconless nights as well. It took exactly 33 hours and 21 minutes to complete the flight from the West Coast to Hazelhurst Field on Long Island.

Pilot Frank Yager flew the plane from San Francisco to North Platte Airport. It was 7:48 a.m. when he arrived at North Platte and turned the plane over to Jack Knight who was waiting to relay the mail through to Omaha. Despite threatening skies and inclement weather, Knight was able to reach Omaha at 1:10 a.m. where he was to be relieved. There he was advised that bad weather and snow between Omaha and Chicago meant that the flight was off. But Knight had other ideas. Leaving Omaha at 2 a.m., he again headed east and one hour and a half later he hit Des Moines on the nose in a driving snow storm. When he finally located Iowa City he had only

Pilot Jack Knight Who Made The First Night Flight From Nebraska To Chicago In 1921.

10 minutes gas left in the tank and couldn't locate the airport. The ground crew, certain that the flight had been cancelled due to the bad weather, had gone home leaving only the night watchman on duty. However, the watchman, hearing the plane overhead, ran out to the center of the field and lit a red flare.

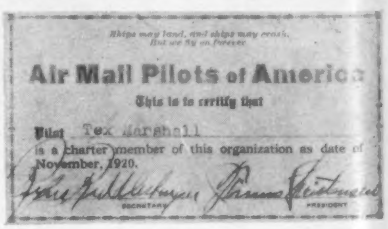
Spotting the flare through the snow storm, Knight came in and landed. With the aid of the watchman he refueled the aircraft and proceeded eastward. At 8:30 in the morning Jack Knight landed in Chicago, completing the first night mail flight after ten hours in the freezing open cockpit of a craft of always doubtful dependability, over an unfamiliar route. A valiant and convincing demonstration that the old motto of all mail carriers "neither rain nor snow, nor heat, nor gloom of night can stay these couriers from the swift completion of their appointed rounds" could now be applied to air mail pilots.

By July, 1924, regular 24-hour transcontinental air mail was in operation. In those days it cost 24 cents to send a letter across the country, while today the domestic rate is seven cents an ounce up to and including eight ounces, with many regular first class letters being carried between major cities by air for only four cents on an experimental basis.

Equipment was quite a problem for the fledgling air mail service. In November, 1918, Dehavilland DH-4 military observation planes were placed in service flying the mails. They had to be withdrawn however, because of weak spots in their design and modified by beefing up the landing gear and moving the gasoline tank to the center section just behind the engine. Before the modification the tanks had been located behind the pilot's cockpit making a crash practically a guarantee of a flaming death as the pilot found himself pinned between a ruptured fuel tank and a red-hot Liberty engine sans cowling of any kind. No wonder the DH-4s were nicknamed "Flying Coffins." With the modifications, the DH-4B, as it was then known, became the standard work horse of the air mail and held that place until 1926, though many other types were used, several pictured in these pages.

The instrument panel on the DH-4 contained an ignition switch, an air speed indicator, a tachometer, a water temperature gauge, and an altimeter which registered 1,000 feet of altitude for each half inch around the periphery of its scale. Since the latter was more sensitive to changes in temperature than it was to altitude, Phillip Coupland, Air Mail Pioneers president, says "it required the service of a mathematician, a statistician and a magician to interpret what the altimeter readings meant." There was a magnetic compass which on an easterly or westerly heading oscillated all the way from North to South when the air was rough.

With no navigational aids, no aerial sign posts, no radio, the pilots still car-



Ships may land, and ships may crash,
But we fly on forever

Air Mail Pilots of America

This is to certify that

Pilot Tex Marshall

is a charter member of this organization as date of November, 1920.

SECRETARY PRESIDENT

ried the mail in weather that stopped all surface traffic. The pilot, road map strapped to his thigh, and if there were no clouds, fog, rain, sleet or snow to obstruct the view, would look over the side of the open cockpit, locate a river, a railroad track, a distinctive barn, or some other landmark and thus determine his heading.

Richard C. McKendry, one of the original pioneers, whose main job was to keep the instruments on those wood, wire and fabric planes in shape, credits much of the success of the early air mail service to the ground personnel—the tireless, and at the time virtually anonymous field managers, field crews, mechanics, radio operators and many others who belonged to the fraternity of dedicated air pioneers. Division stations, he recalls, were thinly manned and poorly equipped. Men worked through many nights until daylight and beyond, often outdoors in zero weather, to get a plane ready for its scheduled departure. Radio operators and station managers usually came to work at 2 or 3 in the morning, not because they had to, but so all weather information possible, gathered by radio and telephone from farms and towns along the route would be available for the pilot by takeoff time.

"The truth is," says pioneer pilot Tex Marshall, "the whole idea of carrying mail across the continent was conceived by ground personnel. The execution of the idea was largely the work of people in the Post Office Department—people who could not fly an airplane. Also, it is a matter of record that more than one-fifth of those who lost their lives in the line of duty in the Air Mail Service were ground personnel.

"Pay?", continues Tex, "good mechanics, often hired as mechanics helpers, started in at $900 per year—$75 a month—$2.50 per day."

"Dangerous planes? In the first few years of the Air Mail there were not many of the ground personnel who did not, at one time or another, have to ride in the mail pits in the line of duty. In a crash the mail pit folded up between the gasoline tank and the Liberty engine."

In retrospect, some of the methods used to navigate seem downright comical when compared with the navigational aids in use today, but they were serious business to the pilot flying the mail. Here is an example of the type of official Air Mail Service instructions provided a pilot flying the run from New York to Bellefonte, Pennsylvania:

"Departing from Hazelhurst Field, Long Island, follow the tracks of the Long Island railroad past Belmont Park race track keeping Jamaica on the left. Cross New York over the lower end of Central Park. Newark, N. J.: Heller Field is located in Newark and may be identified as follows: The field is 1½ miles west of the Passaic River and lies in the "V" formed by the Greenwood Lake Division and Orange Branch of the New York, Lake Erie and Western Railroads. The Morris Canal bounds the western edge of the field. The roof of the large steel hangar is painted an orange color.

"Lehighton, Pennsylvania: Directly on the course. The Lehigh Valley and Central Railroad of New Jersey running parallel, pass through Lehighton. The Lehigh river runs between the railroads at this point. Lehighton is approximately halfway between Hazelhurst and Bellefonte. A fair size elliptical race track lies just southwest of the town by a larger and better emergency landing field about 100 yards west of the race track. The field is very long and lies in a north-south direction.

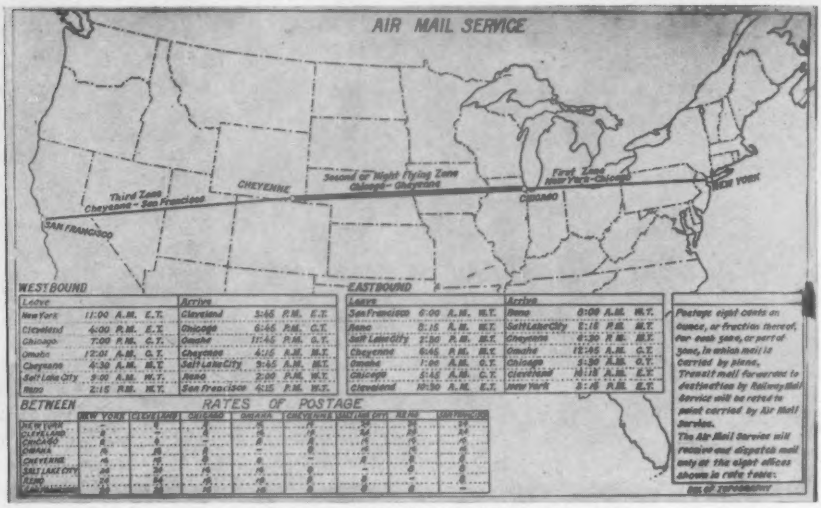
"Sunbury, Pennsylvania: In the junction of the two branches of the Susquehanna river the infield of a race track on a small island at the junction of the two rivers furnishes a good landing field. The river to the south of Sunbury is wider to the north and is filled with numerous small islands. If the river is reached and Sunbury is not in sight look for islands. If there are none, follow the river south to Sunbury. If Islands are numerous follow the river north to Sunbury. Bellefonte, Pennsylvania: After crossing another mountain range without a pass Bellefonte will be seen against the Bald Eagle mountain range. On top of a mountain, just south of a gap is the Bald Eagle range at Bellefonte, may be seen a clearing with a few trees scattered on it. This identifies this gap from others on the same range. The mail field lies just east of town and is marked by a large white circle. A white line marks the eastern edge of the field where there is a drop of nearly 100 feet."

Detailed instructions like these existed for eight other segments of the transcontinental route all the way west to San Francisco.

Tex Marshall, now a New Mexico rancher, recently flew again over his old mail route between Salt Lake City

This Exclusive Photo Shows The First All-Weather Instrument Panel Designed By Air Mail Pilot Wesley L. Smith.

Pioneer Flyer Earl Ovington (r.) Made First Successful Aerial Mail Experiments At A Long Island Fair In 1911.



Air Mail Service Schedule Published In 1925.

and Reno, this time in his Piper Apache instead of the old DH-4. Though the new airway does not follow the same path as the old air mail route, Tex's memory served him perfectly in retracing the old flight path over more than 400 miles of western wilderness.

His flight produced a story of the trip which appeared in the February, 1958, issue of *Flying* called "Flying Down Memory Lane"* in which he recalls that each landmark seemed to have special memories for him. "Soon the Ruby Mountains, 12,000 feet high, could be seen ahead, but I remained low for I wanted to find that big ravine. Sure enough, there it was. Well do I recall a late afternoon of one winter day. Flying west, a heavy snow storm had forced me as low as I could get. Threading up this draw with the wind packing hard gusts of snow, visibility had become almost nil. Passing a low bluff, I had glimpsed a house half dug into the bank. In the open door stood a woman, outlined by the light behind her, watching me. Suddenly, I had become the loneliest person in the world. So close to warmth, safety and shelter. But not for me." Yes, flying the mail was indeed a lonely job.

On landing at Elko, Nevada, Tex recalled, "Instead of the fine, long, hard-surfaced runway, there had been a dirt strip with a wooden bridge in the middle. How careful one had had to be. When the tail skid had passed over the bridge, it would sometimes have hung up on a plank and almost popped the pilot's neck. The idea had been to keep the tail up till over it in a landing. It had been a ticklish business, with a short strip and no brakes."

Further along the route, in a completely wilderness area, Mail Pilot Marshall found another favorite spot. "In the distance is an 11,000-foot mountain where we used to see the brown bears about this time of year. They'd be eating berries and we'd haul out the '45' the Post Office Department required us to wear, and blast away from the cockpit. I'm sure I never came within 50 feet of one, but it was fun, and they'd stand up to watch as we flew by." Yes, there was fun in the job, too.

Another air mail pioneer prominent in the development of flying techniques and the improvisation and use of flight instruments is Dean C. Smith, who joined the Air Mail Service in the spring of 1920. At that time the service was using a miscellaneous collection of airplanes: Curtiss R-4s with Liberty engines, DH-4's with the front cockpit converted into a mail bin, Curtiss Jennys with Hispano engines, Standards with Curtiss OX-5 engines and one Curtiss HA also with a Liberty engine.

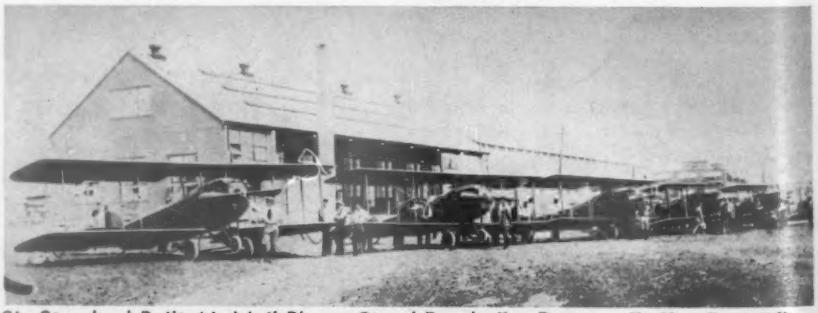
Smith was one of a group of pilots who figured prominently in the development of blind flying. He and his mates figured if they could pull up right in the thick of the bad weather, just high enough to clear the hills, and go along at that level for much shorter periods of time they could be more accurate in their positioning and also be able to come out in the clear in any areas of slightly higher ceilings. To develop this art against an almost universal conviction that it was impossible to fly without seeing some sort of horizon was rather difficult. They gradually developed their technique around the use of a Sperry turn indicator supplemented by a ball in tube for a bank indicator. Smith and fellow pilots carried out endless experiments on the New York-Cleveland run.

Flying in the soup led them to development of the radio beacon. Several forms were tried, including a visual-indicating type that was discarded in favor of the aural since the sense of sight was already overloaded. These were but two of the experiments which Smith and his pioneering pilot buddies worked out to make piloting a safer and saner occupation.

Thousands of other exciting events and hundreds of instances of quiet heroism undoubtedly passed through the minds of all the members of the Air Mail Pioneers who attended the 40th Anniversary Ball at Beverly Hills, California, in 1957.

This article and many more could not do justice to the historic achievements in the lives of all those pioneers who contributed so greatly to make air transportation the great and vital operation it is today.

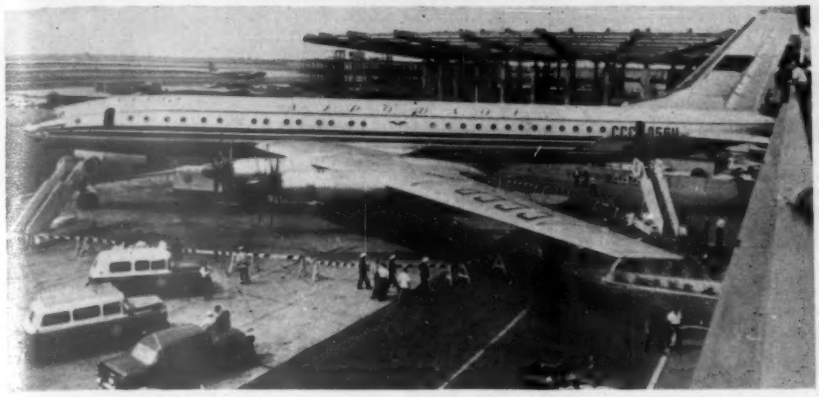
The next time you receive an air mail letter and glance at the cancelled stamp on the envelope, remember the air mail pioneers, those people whose tireless efforts and confidence in the future of air mail service provided the foundation upon which commercial air transportation is built.



Six Standard-Built Air Mail Planes Stand Ready For Delivery To The Post Office Department. Photo Was Taken August, 1918, At Elizabeth, N. J.

*Quoted with permission of the author, R. C. "Tex" Marshall, and Gill Robb Wilson, Editor and Publisher, *Flying*, a Ziff-Davis publication.

Air Line Pilot Visits Russian Turbojet



TU-114 Turbojet Like The One Shown Here Recently Carried Russian Premier Khrushchev To The U.S. For His 13-Day Tour Of This Country.

By John Stefanki, UAL

I HAVE always wanted to view the interior of a Russian airplane to compare it with our equipment. My opportunity arose when the TU 114 flew Frol Kozlov, first vice-chairman of the USSR council of ministers, 5,092 miles nonstop from Moscow to New York to open the Soviet science and technical exhibition in that city.

Initially, I had some doubts about being able to get into the cockpit of this immense airplane but felt that "nothing ventured, nothing gained," so I proceeded to look up the Soviet captain.

It is fortunate that I am able to speak Ukranian for I believe that it helped in breaking the "nyet" obstacle, and definitely helped to break the language barrier.

Delighted Russian

I was able to locate Captain Alexis Yakimov at the unloading stand and proceeded to introduce myself in Ukranian and requested permission to view the TU 114 cockpit. He was astonished and delighted to hear someone speak his language without the use of an interpreter and grinned amiably, immediately consenting to show us the TU-114's inner workings.

Captain Elmer Mulkins, Flight Engineer Fred Riehle, another Flight Engineer from New York whose name I cannot recall, Captain Yakimov, a Russian-English interpreter from the Russian United Nations Legation and I proceeded to climb the stairway and ladder to get up into the airplane. It is so big that it took a conventional Pan American loading stand and a wing ladder mounted on the stand to reach the entranceway.

At Captain Yakimov's command the guard opened the cockpit door and we entered the spacious and comfortable pilots' office.

The first impression is of enclosed vastness. The cockpit consists of separate working areas for the four-man crew. The lack of visibility is even more pronounced on the TU-114 than on our airliners. Captain Yakimov agreed that much was to be desired in the visibility department. I asked him how he landed this plane sitting up so high and with such poor visibility. He laughed and said, "It's just like the rest of the airplanes—just close your eyes and pull back on the yoke until you touch." The two main viewing windows in front of the pilots contained no distortion and appeared to be heated electrically. The other inner panels were very distorted and were heated by direct air blasts from ducts that were integrated into the window frames themselves. Two electrical fans with rubber blades were located on the glare shield to aid in de-fogging.

The navigator has to take a stairway down into the nose of the airplane to assume his station. He has celestial navigation equipment, loran, terrain mapping radar and high frequency radio gear. The flight engineer's console has the propeller controls, fuel gauges, engine instrument gauges and switches relative to engine operation.

Unusual Nose Wheel Steering

The captain's and copilot's instrumentation was similar. An unusual feature was the nose wheel steering. The nose gear steering wheel is a smaller version of the control wheel itself set into the control wheel. Captain Yakimov lauded this feature. It appeared to offer compactness. The trim tabs are hydraulic-electrically controlled. The rudder and aileron trim tab controls are actuated by toggle switches forward of the right hand control wheel position. The elevator trim is controlled by a similar toggle switch forward of the left hand control wheel position. The elevator is the only tab that has an auxiliary manual control wheel located on the outer bulkhead console. The right side of the control wheel contains a separate switch for a transmitter and another for intercom operation. Throat mikes are used with loud speakers for reception.

The autopilot controls are hinged up on the ceiling between the captain and copilot's station. When they are not in use they are folded into the ceiling and are hung down for operation from the ceiling and can be set into three positions: Captain, copilot, and aft. Controls are said to be very good. A disconnect switch is forward of the left hand control wheel. The autopilot is located in the ceiling position due to the lack of a center control console to make way for the navigator's stairway. Utilizing the autopilot from the ceiling would be fine if all was working well, but if the altitude control was wired off it would be quite tiresome for the pilot to keep his arm in an upward position.

V.I.P. Services—But Only For Kremlin Top Brass.

The throttle controls are contained in separate consoles along the outer bulkheads for the pilots. Instrumentation was not of the "T" category but of varied installation and placement. ILS was installed but could not be used at IDL due to not having the

(Continued on Page 30)

Special Report:

Comments Of ALPA To FAA On Pilot Age Limitations

This special report gives the Association's viewpoints regarding the FAA proposal to limit maximum age of pilots. (Draft Release 59-4-5-6) The proposal has created erroneous impressions that the air lines are flying pilots who are incompetent and unsafe because of age. In the Association's opinion, no safety problem related to age exists, and the FAA proposal is an unsound and unproductive approach to in-flight incapacitation. Following is the verbatim report of the Association in opposition to the proposed rule.

The Association, as representative of pilots engaged in air line transportation in the United States, is opposed to the proposed Regulations in all respects for the following reasons:

- The Administrator does not have the power or authority to promulgate the proposed Regulations.
- The Regulations attempt to impose a limitation on existing airmen certificates to the detriment of a pilot's professional and property rights without opportunity for a full hearing at which evidence in support, as well as in opposition to the Regulations is received and examined. The Administrator's action is in violation of due process of law.
- The Federal Aviation Act prescribes the sole means by which the Administrator may limit, suspend or revoke an existing airman's certificate. The proposed rule improperly attempts to by-pass such procedure.
- Existing employment agreements, particularly as interpreted by recent arbitration awards, do not contain age limitations and would be breached by the proposed regulations. The Administrator's actions constitute an intrusion into areas governed by the Railway Labor Act and violate pilots' employment agreements protected by that Act.
- The proposed Regulations represent arbitrary action, do not further safety purposes and are based upon incomplete and inadequate information.
- There is no medical basis for the assumption that age, as such, represents a means of measuring physical fitness or competency.

The comment of the Association is submitted in two sections. Section one is concerned with an analysis of the proposed Regulations, the absence of the Administrator's power and the legal consideration bearing upon the proposed action. Section two is concerned with the absence of any basis for the assumption that age represents a standard of physical fitness or competency.

Section One of Rebuttal

The Administrator is without power to promulgate this proposed rule.

In sections 602 and 609 of the Federal Aviation Act, Congress has determined the exclusive statutory means by which safety standards shall be applied to airman certification.

The proposed regulation imposes a limitation upon airman certificates. Although cast as a direction to carriers not to hire a given class of individuals to fill specified jobs (the Administrator's authority to make such a pronouncement is itself doubtful), the force of the proposed rule falls on the pilot.

The Administrator's power to issue, amend, modify, suspend or revoke airman certificates is derived from Sections 602 and 609 of the Act. At no other point in the Act has Congress legislated as to these matters. It must be concluded that the intent of Congress, as it respects the certification or decertification of airmen, is expressed in these two sections.

Congress has not simply said that an airman's certificate should be given, limited or taken away by the Administrator. It has plainly set forth the conditions under which such action is to be taken and the procedures to be followed by the Administrator when he acts. Nowhere in the Act has Congress vested the Administrator with discretion to vary or to ignore the Congressional determination of standards and procedures for Agency action.

By providing in Section 609 for fair and just procedures when administrative action in derogation of existing certificates is contemplated, and by providing a means by which an individual might defend his certificate from limitation, suspension or revocation, Congress has recognized that a limitation placed on airman certificates restricts the nature of the work available to a pilot. Such limitations bear a direct relationship to the economic well-being of the pilot and his family.

Conversely, whenever the nature of the work which a

pilot is qualified to perform is expressly limited by Agency action, as in the instant case, his certificate, also deprived from the Agency, is no longer co-extensive with the nature of the job he holds, and is, to the extent of the inconsistency, amended. The question next presented is whether the amendment to certificates was effected by the procedures prescribed by Congress. Under the proposed rule, the procedures are unlawfully ignored.

Section 602 requires the Administrator to issue an airman certificate only to a person who "possesses proper qualifications for, and is physically able to perform the duties pertaining to, the position for which the airman certificate is sought." An investigation into the qualifications of each applicant is plainly contemplated. Section 602 further states that the certificate issued by the Administrator shall contain "such terms, conditions, and limitations as to duration thereof, periodic or special examinations, tests of physical fitness, and other matters as the Administrator may determine to be necessary to assure safety in air commerce." Congress has here stated that the application of physical standards to pilots is to be done on an individual basis in each specific case.

Section 609 permits the amendment, modification, suspension or revocation of an airman certificate only after re-examination or investigation in the individual case, and only after the holder of the certificate has been provided the opportunity "to answer any charges and to be heard as to why such certificate should not be amended, modified, suspended or revoked." Appeal to the Board (which body says the Act, "shall not be bound by findings of fact of the Administrator") and to the Courts is expressly provided in Section 609 cases.

The intent of Congress is clearly disclosed by Sections 602 and 609. These sections establish an exhaustive blueprint for all Agency action in respect to certification. Congress has left no room for administrative improvisation.

It clearly appears from Sections 602 and 609 that each and every denial, amendment, modification, suspension or revocation of an airman certificate is to be preceded by investigation into the qualifications of the person affected in cases under Section 602, and by reinspection, reexamination and the opportunity for a hearing at the agency level extended to "any person whose certificate is affected by . . . an order of the Administrator under (Section 609)" in cases falling within Section 609.

These prescribed procedures are deliberately intended in the interest of justice and fairness to slow down Agency action respecting any action affecting certification to pilots and to insure that hasty ill-founded Agency action does not deprive a pilot of his means of livelihood or miscast him as a safety risk when such is not the case.

In contrast to these clearly defined statutory procedures is the Administrator's proposal by a single act to revoke the certificates of one group of pilots, and to amend the certificates of thousands of other pilots. By his action, the Administrator has attempted to by-pass all of the procedural safeguards so carefully written into the Act.

Individual Application of Safety Standards

Individual application of safety standards to pilots 60 years of age as required by the Act, is both appropriate and feasible.

In Draft Release 59-4, 59-5 and 59-6, the Administrator states that:

"In 1947 there were no active airline transport pilots aged 60 or over. By 1962, it is predicted that there will be at least 80 active airline transport pilots in that age group, and that by 1967 the number will be about 250."

Concededly, there are now no more than 80 active airline transport pilots aged 60 or over. It is probable that the present figure is far less than 80. The Administrator proposes to treat this small group by means of a broad rule.

During the period from 1962 to 1967 the Administrator expects the number of pilots in this age group to increase to 250. This is the equivalent of an average annual increase during those years of 34 pilots.

It cannot be claimed that the thorough examination of this small number of pilots each year pursuant to procedure established under Sections 602 and 609 would place an undue burden upon the Administrator. All captains, who would normally comprise the senior group, undergo physical examinations semi-annually at the present time.

No general rule can operate as thoroughly and efficiently as an ad hoc determination based upon investigation and facts supported by evidence in the individual case. Congress has prescribed that a general rule may not be substituted for individual physical examinations. No power is given to the Administrator to defeat this Congressional direction by means of evasive Agency legislation.

No Proper Basis

The Administrator's statement in Draft Releases 59-4, 59-5 and 59-6 that ". . . knowledge of the aging process specifically related to piloting aircraft is incomplete . . ." demonstrates the absence of a proper basis for such a general rule.

Based on such lack of information, the proposed regulation will operate to divest many persons of their airman certificates, and will sharply affect the career and earnings of many pilots now certified. The Administrator is empowered by Section 601 (a) (6) to prescribe

"Such reasonable rules and regulations, or minimum standards, governing other practices, methods, and procedure, as the Administrator may find necessary to provide adequately for national security and safety in air commerce."

The Administrator may regulate only where he finds regulation necessary to provide adequately for national security and safety in air commerce. Such action cannot be supported where the Administrator has admitted that his knowledge, and that of medical science, of the aging process as it relates to piloting aircraft, is incomplete.

Information on the aging process which has not yet come to the attention of the Administrator may well show that regulation such as he now proposes is not necessary to promote the stated policies. As long as the information which the Administrator has collected remains incomplete, he is logically and legally incapable of making an effective finding of necessity as required by statute. That Act requires that there be found necessity, not merely a possibility or even a probability of the existence of necessity.

For this reason the Administrator is without power to promulgate the proposed rule.

The rule does not promote safety and therefore falls outside the authority delegated to the Administrator by Congress. The Administrator bases promulgation of the proposed rule on the furtherance of safety in air commerce. Upon careful scrutiny, the relation to safety of pilot chronological age becomes obscure.

The Administrator has elected to act under Part 40 of the Civil Air Regulations, entitled "Scheduled Interstate Air Carrier Certification and Operation Rules." He chose not to establish the new rule in Part 20 "Pilot and Instructor Certificates" or Part 29 "Physical Standards for Airmen."

All regulations prescribing minimum age and physical standards for airmen are found in Parts 20 and 29. In choosing Part 40, the Administrator has evidently elected to treat maximum age of pilots not as a matter of physical standards but rather as a matter of air carrier operational rules. Perhaps Part 40 was selected because it embodies those regulations promulgated under Section 604 of the Act, and in the belief that Section 604 provides authority for this rule.

Section 604, however, relates to safety standards to be observed by individual carriers to whom the Administrator issues an operating certificate. Its language contemplates that these standards will vary with each applicant for a certificate, depending upon the routes, equipment and size of each. Section 604 does not authorize Agency action whose only effect is to place a limitation upon existing airman certificates, especially where an exclusive statutory scheme for amending or modifying certificates elsewhere has been clearly provided.

The normal way to determine physical ability or inability is through reasonable and universally accepted medical examinations. With the exception of persons below the age of, say, 10 and above the age of, for example, 90, a person's age, without more, tells nothing of his physical capabilities. If, therefore, the Administrator desires to insure safety in air commerce by providing for increased physical standards for airmen, he will not accomplish his purpose through a regulation of maximum age.

No relationship has been shown between age of pilot and accident frequency. Indeed, none, in fact, exists. No accident or incident has been attributed to the age or physical condition of the pilot. No example has been cited of a certificated pilot, aged 60 or over, who has been found physically unfit to perform his duties. Periodic physical examinations are effective in sifting from the group all those pilots physically unfit to safely perform their duties, regardless of age.

The test of maximum age adds nothing to the accuracy and effectiveness of the tests now used to qualify pilots. As an exclusionary device, its effect will be felt only by those who have successfully maintained the high physical standards for continued certification, the test of maximum age will have but one major effect—to deprive the industry of the valuable services of many physically able, capable pilots of long and valuable experience.

Sections 313 (a), 601, 602 and 604 of the Act, cited by the Administrator as authority for the proposed rule, do not sustain his position. Sections 601, 602 and 604 all relate to safety powers. Since pilot age is not relevant to safety, and since the proposed rule would amend existing certificates in a manner contrary to the express intent of Congress as found in Sections 602 and 609, the

proposed rule finds no justification in Title VI of the Act.

Moreover, subdivisions (1)-(4) of Section 601 (a) relate to functioning and maintenance of aircraft and equipment. Subdivision (5) deals with an aspect of the performance of the duties of airmen and other employees of air carriers. Under the rule of *eiusdem generis,* the general words in subdivision (6) "other practices, methods, and procedure" relate to subjects of the same general character as were treated in the foregoing specific subdivisions. Subdivision 6 of Section 601 (a) does not therefore authorize rules or regulations respecting the maximum age of pilots.

No authority can be found in Section 602 for rules and regulations affecting persons already holding an airman certificate. In addition, the proposed maximum age limitation is framed not in terms of physical requirements for issuance of a certificate, but in terms of a mandate to air carriers not to use certain pilots, who are already certificated, to fill the specified job.

Section 604 relates to safety standards to be observed by carriers to whom the Administrator issues an operating certificate. Its language contemplates that these standards will vary with each carrier, depending upon the operating characteristics of that carrier. This section does not authorize regulation of the maximum age of pilots.

Since Section 313 (a) authorizes the Administrator to regulate only pursuant to and consistent with the provisions of the Act, he will, for the foregoing reasons, find no justification in that section.

Generalities Make Proposed Rule Arbitrary

The proposed rule is arbitrary because of its unnecessary generality, its admittedly incomplete basis in fact, and its incompatibility with express Congressional mandate.

▶ There can be no claim that the number of pilots now or in the next several years who will reach age 60 is too large to process individually.

▶ If a small group of pilots is to have a limitation imposed this must follow consideration on an individual basis, as directed by the statute, and for a reason directly connected to their qualifications for the employment they hold.

▶ The proposed rule not only represents action contrary to explicit Congressional directive, but is also infirm in its avowed lack of a complete basis in fact. Administrative action taken before the Administrator has gathered facts which show the necessity, or the advisability for taking such action, is arbitrary and unreasonable. The Administrator has no power to promulgate rules based upon his best guess of a state of facts. Persons to be affected by administrative action have a right to expect that an exhaustive investigation of all relevant factual considerations will underlie administrative regulation.

▶ Action by the Administrator so clearly contrary to the intent expressed by Congress in Sections 602 and 609 is patently arbitrary.

The Courts are not tolerant of unauthorized action by administrative agencies. When Congress passes an act empowering administrative agencies to carry on governmental activities, the power of those agencies is circumscribed by the authority granted. The Courts will not permit administrative agencies to exercise powers not delegated to them.[1] Moreover, administrative agencies are not free to ignore plain limitations which Congress has placed upon their authority.[2]

What Does This Rule Do?

The rule would invade pilots' property rights without due process of law. The proposed rule would require that carriers immediately discharge from service all pilots over the age of 60. No opportunity to object or show fitness to continue is extended. They would be victims of the Administrator's presumption that no pilot who has reached age 60 can still be physically qualified to continue the practice of his profession.

That the Administrator's age 60 rule is without merit is dealt with elsewhere herein. Regardless of the merits, the Constitution forbids the Administrator to deprive pilots of the means of livelihood in the manner proposed.

The right to engage in a lawful profession or occupation is a property right of which one may not be deprived without due process of law.[3]

Existing agreements covering pilots in the industry, make the later career years economically the most rewarding. The opportunity to qualify for and fly higher rated equipment is enhanced by relative seniority. To deprive a pilot arbitrarily of a full career, professionally and economically, is not sound administrative policy and will not stand the test of judicial review.

It is very easy to underestimate the economic impact of a proposal which deprives a pilot of a number of years of peak earnings. Each case, of course, should be computed individually.

▶ The following example demonstrates the value of earnings and pension accruals for ages 55 to 60.

Pilot began his air line career at age 30 (1934).
Is now 55 and senior enough to fly jets.
Average salary 30-55—$12,000 a year.
Average salary 55-60—$28,000 a year.
Assured Pension Program negotiated 1955
"A" Fund .75% of first $3,000
1.5% of excess over $3,000
"B" Fund 4% of salary Company contribution
4% of salary Pilot contribution
Past Service Credit—10 years.

▶ Gross Worth of Career ended at 55

25 years at $12,000=	$300,000.00
Pension payments (23 years life expectancy)	36,666.14
Total	$336,666.14

▶ Gross Worth of Career ended at 60

25 years at $12,000=	$300,000.00
5 years at $28,000=	140,000.00
Pension payments (18 year life expectancy)	97,108.20
Total	$537,108.20
Gross Worth of Career ended at 60	$537,108.20
Gross Worth of Career ended at 55	336,666.14
Difference	$200,442.06

Therefore, if this typical pilot were forced to retire five years early and were deprived of five years of peak income, his total career earnings would be reduced to approximately 60% of his normal career potential. It may be fairly assumed that for a period of 60 to 65 there would be a loss in career earnings of $140,000.

Certificates now held by pilots contain no limitations in respect to maximum age. These certificates represent a property right valuable to pilots. The Administrator proposes action which will seriously restrict the scope of this property right and which will require all pilots to make serious adjustments in the method of their affairs, and force them to seek employment in other industries upon reaching the age of 55 or 60. This amounts to a substitution of new and different certificates for the ones they now hold. Such action may not be taken without observing due process of law.[4]

It would constitute an adjudication that certain individuals are unfit to continue in the pursuit of a lawful profession.

According to the figures stated by the Administrator, less than 80 pilots aged 60 or more are now employed by air carriers. This small group will immediately be cut off if the proposed rule becomes operative.

Although couched in the language of a general rule, the proposed regulation plainly has the effect of an adjudication of the fitness of each pilot who has reached age 60. Congress has recognized that such regulation of outstanding certificates, as in the manner proposed here, would, in fact, be adjudication, and has therefore specified in the Act that, where such action is proposed by the Administrator, it be preceded by observance of specific procedures which insure fairness and justice in the individual case.

A major consequence of labeling action as adjudication rather than rule making is that procedural due process demands stricter observance of procedures which insure fairness to individuals affected. It is perhaps for this reason that the adjudicatory form was avoided by the Administrator in the instant case. The law, however, looks to what has actually been done, and not merely to the label attached to the administrative action.[5]

In the Storer case F.C.C. rules had limited the number of radio stations which one party might own or control. The Court upheld Storer's claim that his application for an additional radio station license could not be rejected without observance of due process, stating that Storer was entitled to a hearing to challenge the validity of the agency rules.

Again, in Londoner v. Denver, 210 U.S. 373 (1908), the Supreme Court held that where a relatively small group was exceptionally affected, in each case on individual grounds, due process required a hearing on rules promulgated by a local tax assessment board. Here again, the Court looked to the effect of the agency action and not to the label which had been attached to that action in determining the degree to which due process protections were applicable.

The proposed rule therefore represents an adjudication that

1. Stark v. Wickard, 321 U. S. 288 (1943); Arizona Grocery Company v. Atchison, T. & S. F. R. Co., 284 U. S. 370 (1931).

2. Peters v Hobby, 349 U. S. 331 (1954); F. C. C. v. American Broadcasting Co., 347 U. S. 284 (1953); Addison v. Holly Hill Fruit Products, 322 U. S. 607 (1943).

3. Slochower v. Board of Higher Education of the City of New York, 350 U. S. 551 (1955), reh. den. 351 U. S. 944 (1955); Schware v. New Mexico Board of Bar Examiners, 353 U. S. 232 (1957); Sharp v. Lucky, 252 F. 2d 910 (5 Cir. 1958); Duplex Printing Press Co. v. Deering, 254 U. S. 443 (1921); Traux v. Corrigan, 257 U. S. 312 (1921).

4. Columbia Auto Loan, Inc. v. Jordan, 196 F. 2d 568 (D. C. Cir. 1952); In re Carter, 192 F. 2d 15 (D. C. Cir. 1951).

5. U. S. v. Storer Broadcasting Co., 351 U. S. 192 (1956).

certain individuals are unfit to continue in the pursuit of a lawful profession, and considerations of procedural due process must therefore be observed.

Unlawful Denial of Evidentiary Hearing

It would represent the unlawful denial of an evidentiary hearing to persons directly affected, in direct disregard of the exclusive statutory procedure for agency adjudication prescribed by Section 609.

Section 609 of the Act states, in part: "Prior to amending, modifying, suspending or revoking (an airman certificate), the Administrator shall advise the holder thereof as to any charges or other reasons relied upon by the Administrator for his proposed action and, except in cases of emergency, shall provide the holder of such a certificate an opportunity to answer any charges and be heard as to why such certificate should not be amended, modified, suspended or revoked."

If the Administrator had observed this procedure each pilot affected by the proposed action would have had the opportunity, at an evidentiary hearing, to defend his fitness in the face of the facts upon which the Administrator relies. Merely because the Administrator has deviated from the pattern of action prescribed in Section 609 is not sufficient reason to deprive pilots of rights which have been conferred upon them by Congress in Section 609 of the Act, rights which the Administrator has no power to take away.

These rights include the right of a pilot, at a hearing, to "answer any charges and be heard as to why such certificate should not be amended, modified, suspended or revoked." Congress intended that pilots, when faced by administrative action, which proposed to limit existing certificates, should be afforded the opportunity to present evidence, to meet the opposing evidence, present written and oral argument and to cross-examine opposing expert witnesses. Congress intended that in such cases the administrative tribunal should make a determination on the record.[6]

Section 1006 (e) of the Act, relating to the effect of administrative findings of fact upon judicial review, states that the Administrator's findings of fact are conclusive only if supported by substantial evidence. Plainly contemplated by this language is a proceeding below in which a record was made and evidence upon both sides of the controversy was presented and fully tested.

Furthermore, Section 1006 is clearly applicable to the agency action here. Section 1006 (a) states that any "order" is reviewable. In Columbia Broadcasting System v. United States, 316 U.S. 407 (1942), the Supreme Court, dealing with a section of the Federal Communications Act, identical in language and purpose to Section 1006 of the Federal Aviation Act, held that agency regulations which affect or determine rights and which operate to deny or restrict a license, are "orders" within the meaning of the statute.

In Minkoff v. Payne, 210 F. 2d 689 (D. C. Cir. 1953) it was held that ". . . when . . . the Board action amounts to refusal to renew a license previously issued, it must be based upon evidence which the applicant had full opportunity to refute." (Emphasis supplied) 210 F. 2d at 691. This principle has been universally accepted.[7]

In Goldsmith v. U. S. Board of Tax Appeals, 270 U.S. 117 (1926), the Supreme Court reversed the Board's rejection of an application for admission to practice before it, stating that the applicant "should not have been rejected upon charges of his unfitness without giving him an opportunity by notice for hearing and answer." 270 U.S. at 123.

Schware v. New Mexico Board of Bar Examiners, supra, is a similar case and there the Supreme Court reaffirmed the principle that procedural due process—opportunity to present and to rebut evidence on a record—must be extended where it is proposed that a license be denied on the basis of the applicant's unfitness. In the case of In re Carter, 177 F. 2d 75, cert. den. sub nom Laws v. Carter, 338 U.S. 900 (1949); id. 192 F. 2d 15, cert. den. 342 U.S. 862 (1951), where the licensing body attempted unsuccessfully to revoke and later to refuse to renew the license of a bondsman without holding a hearing, it was held that the orders attempting to revoke and refusing to renew the license were invalid because not based "upon a proceeding which contains the elements of due process of law, i.e., a hearing and revelation of all data upon which a decision is to be based." 192 F. 2d at 17. See also Londoner v. Denver, supra.

These considerations require the Administrator to withdraw any attempt to treat this matter by means of a general rule rather than by means of the adjudicatory procedure prescribed in the Act. The Courts will not countenance administrative action which so plainly denies to individuals their rights under the Act and under the Due Process Clause of the Fifth Amendment.

Furthermore, even if it is to be assumed for the purposes of argument that this administrative action is to be treated as rulemaking and not as adjudication, a hearing is nevertheless necessary. The Supreme Court has held in Borden's Farm Products, Inc. v. Baldwin, 293 U.S. 194 (1934), that ". . . where the legislative action is suitably challenged and a rational basis for it is predicted upon the particular economic facts of a given industry, which are outside the sphere of judicial notice, these facts are properly the subject of evidence and of findings. With the notable expansion of the scope of government regulation, and the consequent assertion of violation of constitutional rights, it is increasingly important that when it becomes necessary for the Court to deal with the facts relating to particular commercial or industrial conditions, they should be presented concretely with appropriate determinations upon evidence, so that conclusions shall not be reached without adequate support." 293 U.S. at 210.

The proposed regulation would impair existing collective bargaining agreements. Section 401 (k) (3) of the Act states "Nothing herein contained shall be construed as restricting the right of any such pilots or copilots, or other employees, of any such air carrier to obtain by collective bargaining higher rates of compensation or more favorable working conditions or relations."

Pilot age is not a matter of safety. It is rather a problem of economics and industrial relations. It is therefore appropriately treated only in the collective bargaining agreements covering pilot employment. Furthermore, the federal agencies which are empowered to prescribe rules and regulations for the railroad and trucking industries have never established a compulsory retirement age for operating personnel despite the tremendous responsibility for public safety imposed on the operating personnel of passenger and freight trains and the operators of large interstate trucks.

Where compulsory retirement ages have been established in an industry this has been accomplished either by arbitrary rule of management where the employee group is not organized or where provided by the collective bargaining agreement.

Arbitrary termination of the working life of an individual involves many considerations. It involves, for example, the career earnings potential of people that industry is attempting to attract to this particular profession, the training cost of replacement personnel, the arbitrary loss of key personnel, the economic impact on management and the employees of reducing the working years, the amortization of training costs, the responsibility of management and the representing organization to provide for a rational transition to retirement which will preserve the mental and physical well-being of employees, and many other economic and social considerations. The only federal legislation under which all of these problems may be handled is the Railway Labor Act.

The Federal Aviation Agency is empowered to consider only safety in connection with the proposed regulation. If the Administrator permits any other considerations to influence his thinking on this subject, he is exceeding his authority under the Federal Aviation Act. He has no authority to reimburse the pilot for earnings lost when his career is arbitrarily terminated by an arbitrary regulation. He has no authority to prescribe a rational and sensible transition for the individual pilot from his working life to a retired position. He has no authority to make individual judgments and exceptions to his proposed rule because one individual at age 60 may have a physical competency level of a man of 40. Yet all of these problems may be considered and provisions made to handle them under the processes of the Railway Labor Act.

If an individual air carrier management feels that a chronological retirement age is desirable it may utilize the provisions of the Railway Labor Act for the negotiation of a contractual provision establishing such a requirement. The fact is that no air line management has conceived this to be an important enough problem to serve a Section 6 notice of proposed amendment to a collective bargaining agreement under the Railway Labor Act on this subject.

Employment agreements in the industry generally permit pilots to work without limitations as to their age. In two recent cases agreements, typical of those throughout the industry, have been interpreted by arbitration awards as placing no limitation upon the employment of pilots in terms of their age.

The right of pilots working under these agreements to continue in their jobs free from compulsory retirement is, in the language of Section 401 (k) (3) of the Act, plainly a "favorable working condition" for pilots. That section states that nothing in the Act empowers the Administrator to restrict the rights of pilots to obtain more favorable working conditions. But, by this proposed rule, that is exactly what the Administrator has done.

The subject matter of the proposed Regulations is more effectively, economically, and appropriately treated on an individual pilot basis.

6. Londoner v Denver, supra; In re Carter, 192 F. 2d 15 (D. C. Cir. 1951), cert. den. 342 U. S. 862 (1951).

7. Columbia Auto Loan, Inc. v. Jordan, 196 F. 2d 568 (D. C. Cir. 1952); Gilchrist v. Bierring, 234 Iowa 899, 14 N. W. 2d 724 (1944).

Every pilot must pass a number of checks a year. If a captain, he undergoes an exhaustive physical examination every six months, proficiency examinations at least twice a year and, in some cases, more often. He must meet current physical and proficiency examinations. His health and proficiency are being continuously evaluated. To remain in the cockpit the pilot of 60 must be able to meet the same standards that are applied to a pilot of 30.

It would not unduly burden the Administrator to intensify these same examinations in the case of pilots 60 years of age and over. Or, quarterly rather than semi-annual examinations might be required for these pilots if a closer check on them is desired. In either case, the enormous waste of valuable, qualified pilots which is the unavoidable result of the Administrator's proposed rule would be averted.

It is to the best interest of air carriers, as well as the pilots, to avoid the "meat ax" approach contemplated by the proposed rule. The carriers would be exposed to an unnecessary financial burden. They would be deprived of the services of healthy, competent pilots in whom they have invested many thousands of dollars in training and experience and who have survived and mastered the trials and tribulations of this highly skilled profession and be forced to secure and train replacements of unknown qualifications. Furthermore, they would be faced with restoring the career potential earnings of the pilot for a shorter working period.

Medical Evidence

The weight of medical and other expert evidence overwhelmingly demonstrates that the Administrator's medical and factual conclusions are unsound.

It is asserted that the "Matter of Age of the Pilot and its Effect on the Skills of Piloting . . . (has now) . . . become of critical importance."

No basis is given for this statement. Repeated studies and investigations over a period of many years have attempted to correlate pilot age with air safety, pilot skill, or pilot physical condition. They have been uniformly unsuccessful in relating pilot aging to any safety program, and we know of no new evidence which invalidates conclusions previously reached on this subject. Significant independent studies have been made.

It is asserted that "for present purposes" aging is a process involving "progressive deterioration of certain important physiological and psychological functions . . . (which) . . . continues unrelentingly until death."

This statement may not be applied to specific individuals when it is tied to an arbitrarily selected chronological age. Recognized authorities have written at length on this subject. In reviewing these writings we have been particularly impressed with:

- The very considerable amount of research already accomplished.
- The emphasis which is placed on individual variability.
- The emphasis given warnings regarding the fallacy of correlating chronological age with functional or physiological age for specific individuals.

It is asserted that certain observations regarding the aging process which are applicable to piloting aircraft have been made and generally understood. We shall discuss them separately and briefly.

The Administrator asserts that the frequency of heart disease in upper age brackets is so high that a chronological age cut-off is justified because of the potential incapacitation which can occur from resulting heart attacks.

Statistics are cited in support of this assertion indicating that the death rate from heart disease is 10 times greater for persons aged 45 to 64 then for those aged 25 to 44 and that by age 65, cardio-vascular disease (including heart disease) causes more deaths than all other medical conditions combined. The logical justification for selecting the specific age 60 from these figures is not apparent to us. This justification becomes even more elusive when you consider the electrocardiogram requirement for Class I pilots which was adopted in order to detect those individuals who have suffered an initial attack of myocardial infarction. It was stated that the annual mortality rate for those who have suffered an initial attack of myocardial infarction is from 3 to 15 times greater than that of the general population of the same age and that this justified their elimination as pilots. It would therefore appear that if those individuals were screened out the mortality rate of the remainder would be significantly decreased.

We also believe that extreme care must be taken when national or selected group averages are applied to air line pilots. This is true because of the natural process of selectivity and elimination which is an inherent part of being an air line pilot. This process begins with initial employment and continues to the very end of each pilot's career. For example, Dr. G. J. Kidera, Medical Director of United Air Lines, told the 23rd Annual Meeting of the Aero Medical Association that, in a particular period surveyed, only 99 out of 2,366 applicants for pilot employment successfully completed the pre-employment screening tests necessary for assignment to the UAL Flight Training Center.

An example of this process at work at the other end of pilot careers was given to the 25th Annual Meeting of that Association by the late Dr. Howard K. Edwards, then Medical Director of Eastern Air Lines. He reported that nearly one-fifth of their aging pilots voluntarily retired from flying between the ages of 50 and 60. Of course, there can be a variety of reasons for early retirement. Among them might be advancement to more lucrative positions, physical reasons, "tired of flying," loss of competency, or many others. However, and this is extremely important, for purposes of their job, the individuals who remain are a highly select group in terms of motivation, competency, and physical condition. An idea of the extent of this continuing elimination process is given in a study made on a major air line which revealed that in a 14-year period, 196 out of a total of 699 on the system seniority lists were no longer active pilots. Only three actually flew schedules until age 60. Another example is cited by Dr. Ross McFarland who has reported that a 1948 survey of the first 500 members of the Air Line Pilots Association revealed that only 29% of them were still active air line pilots, 22% had been promoted to executive status, 31% were no longer with the air line, and 18% had died from natural or accidental causes.

Additional evidence was given in the April, 1954, AIR LINE PILOT by Captain S. J. Devine, then Chairman of the ALPA Pilot Retirement Committee. Captain Devine reported, "The preliminary findings of the Committee indicate that the rate of attrition of the air line pilot group (excluding probationary pilots) approximates 3% per year. More amazing is the age of those included in the 3%. In 89% of separations studied so far, the pilot has been less than 40 years of age! Of a given group of 100 copilots, 25 years of age, only 10 will have a mathematical chance of flying until age 55."

At a much earlier date, Captain A. F. Foster had been concerned with this problem. On May 7, 1948, he told the Third Meeting of the ALPA Executive Board, "It is a sober fact that on July 1st of last year there were just 55 members of the Air Line Pilots Association who were 50 years of age or over and who were still active pilots. . . . Further, there were only 109 other members who were active flyers who were between 35 and 49—a total of 164 pilots who were 45 and over on July 1 last year. These were the survivors of 317 pilots 90 months earlier, a net dropping out of 48.3 per cent."

While these surveys are not strictly comparable because they covered different periods and may not have used identical criteria, they do provide rather graphic illustrations of the continual process of elimination which is a part of this profession. Whether reasons for these eliminations were voluntary or involuntary, or for personal, competency, or physical reasons is largely irrelevant. The facts are simply that those who remain are a highly select group. Any attempt to equate them with the general population in areas influenced by this selectivity, such as general physical condition, must be seriously questioned. Any individual who has survived the selective process of qualifying for flight training, the many hurdles to success in training, the air line hiring programs, twenty-five or more years of constant physical and competency selection by air line and government examiners, is hardly an average person.

This latter point was illustrated by Dr. Kidera at the 107th Annual Meeting of the American Medical Association. Dr. Kidera's study covered 100 senior air line pilots over a 20-year period. Considering the concern with cardiovascular problems which is apparent in the FAA proposals and the generally accepted fact that obesity and high blood pressure are two of the major factors believed to increase susceptibility to heart attacks, the following paragraphs from Dr. Kidera's paper are especially pertinent.

". . . In reviewing weight gain it was anticipated that a rather sizable increase in weight over the 20 years would be found. This was not the case. Weight in 1937 averaged 157½ lb. (71.4 kg.), with a variation between 211 and 127 lbs. (96.2 kg.) and (57.6 kg.), while in 1957, the average was 169½ lb. (76.9 kg.). The heaviest man weighed 221 lbs. (111.2 kg.) and the lightest 136 lbs. (61.7 kg.), An average weight gain of 12 lbs. (5.4 kg.) during a 20-year span was considered excellent. This is further emphasized in the light of a report by Captain Huber of the U. S. Navy. (Huber studied a group of Navy pilots and found an average weight gain of 29 lbs. (13.2 kg.) per man over a 10-year period). . . . Pulse rate, blood pressure, and vital capacity were periodically determined, and in 1937 and 1957 the average compared as follows: pulse rate, 65.9 and 65.5 per minute; blood pressure, 114/72 and 115/78 mm. Hg (ranges, 96/56 to 154/78 in 1937 and 98/58 to 158/84 in 1957). . . . The highest recorded blood pressure was 158/84 mm. Hg; this occurred on a single reading in 1957, in the same man who in 1937, had the highest reading, 154/79 mm. Hg. Similarly, the man who, in 1937 had the lowest blood pressure re-

cording, 96/56 mm. Hg. also had the lowest reading in 1957, 98/58 mm. Hg. . .".

When one remembers this inherent continuing selectivity as well as individual variability, the air safety significance of rate changes of the order of 1% per year for an unselected adult male must be seriously questioned. Further, when a proposal's justification requires that both of these factors be ignored, we do not believe that proposal can reasonably be given serious consideration.

The Administrator's assertions that "abilities to perform highly skilled tasks rapidly, to adapt to new and changing environmental situations, and to perform effectively in a complex and stressful environment, begin to decline in early middle life and continue to decline at a fairly steady rate thereafter," and that the "ability to apply experience, judgment, and reasoning rapidly in new, changing, and emergency situations is progressively lost with age at a rate comparable to the loss of rapid performance of highly skilled tasks" will be discussed together because of their essential similarity.

These concepts are obviously not applicable to individuals who periodically demonstrate that they can satisfactorily perform the particular task in question. We, of course, are referring to the periodic route and competency checks which are required of all pilots. Competency check require the actual demonstrtaion of ability to perform normal and emergency maneuvers satsifactorily including their performance at a satisfactory rate, adaptation to a new and changing environment, and performance in complex and stressful situations. To maintain that 60-year-old pilots cannot demonstrate competency when they already have done so, and when they continue to demonstrate it satisfactorily, seems at best an exercise in futility. It is about as effective as patiently explaining to the bumblebee that it can't fly.

These comments are particularly relevant on those air lines which have simulator programs where emergency situations considered too dangerous to practice in an airplane are routinely performed.

Use of Flight Simulators

This characteristic of modern flight simulators was emphasized by the Civil Aeronautics Board in their Draft Release (56-16) involving the use of aircraft simulators in training program and proficiency checks. They stated:

"Furthermore, the quality and effectiveness of flight crew training depends very largely upon the opportunities afforded flight personnel to experience realistically the critical situations that they may possibly experience in an airplane, and as members of an integrated and coordinated cockpit team, to take such immediate action as each situation requires. Properly designed and operated simulators afford such opportunities . . . With training devices, it is possible to re-enact emergency situations too hazardous to simulate exactly in an actual airplane in flight, or those which are impossible to perform in an airplane. For example, simulated engine failures must presently be accomplished in flight at the authorized maximum take-off weight and power, or with a suitable combination of lower weights and power; air carriers, pilots and CAA have objected to this requirement as being unnecessarily hazardous and burdensome . . . Also, such emergency situations as fuel dumping, icing, fire in flight, loss of control, accidental reversing of propellers in flight, and others which cannot reasonably be accomplished in flight, can be simulated realistically, and crew men can become proficient in taking appropriate corrective action through all degrees of the emergency situation, including the 'crash' condition."

Flight simulator characteristics were also emphasized by Scott Flower, Assistant Chief Pilot, Pan American World Airways, who told the Society of Automotive Engineers that, "By continuous repetition of simulated emergencies, it has been possible to attain a standardization of team work heretofore unknown within our experience in transition training. It is the consensus among the crews who have received this syllabus that their training is more thorough than that received on any other type of aircraft which they have flown."

Captain Flower also offered this example of the degrees of realism attained in these simulators:

"The failure of engines and aircraft equipment will, unfortunately, always be with us. The unfortunate aspect of these failures is that flight crews have no control over the time at which they occur, and, therefore, are sometimes caught unaware. To combat these failures, it is important that crews be subjected to a large variety of them so they may be versed in the performance of the aircraft under these conditions and to minimize the psychological effect of the 'Gee, I've never experienced that before!!!' The simulator is ideal for this type of training. Conditions have been simulated where a crew has to contend with a three-engine flight due to an engine failure en route, under icing conditions, with heavy turbulence and an instrument letdown at destination during which a fire developed in one of the remaining engines. During the flight, the flight engineer is heckled with the wing and tail de-icing heater showing overheat indication from time to time, or a loss of fuel pressure due to the anti-icing combustion heaters, etc. Be assured that these are not impossible situations but the compounding of difficulties that have led and can lead to a disaster. The realism is so great during one of these problems and the nervous tension so high that crew members perspire quite freely and pilots witnessing the performance from the jump seat have even been seen holding on and giving a sigh of relief when the simulator reaches the runway. This is real training!

"A very amusing incident occurred during one of our simulated flights while demonstrating the value of the equipment to CAA officials. Shortly after the take-off, a failure occurred in the simulator affecting the trim mechanism on the elevator, making it very difficult to control the aircraft longitudinally. The Captain turned to the First officer and shouted, 'Get clearance to land immediately, then get on the controls and help me fly this thing'. The CAA inspector sitting in the jump seat immediately reached down and secured his safety belt."

Considerable concern over the effects of "stress" was indicated in the Draft Releases. We agree that stress in excess of some rather ill-defined and individual upper-limits is undesirable and can impede efficiency. However, we do not believe that imposing a chronological retirement age for pilots effectively meets this problem. A constructive approach is found in Draft Release (59-3) which would require FAA approval of air line training programs because an integrated and adequate training program provides one of the most effective means of keeping cockpit stress within limits which do not impede efficiency and judgment.

In April of 1953, O'Kelly and Matheny published A Survey of the Effects of Stress on the Performance of Pilots. The following quotations from this report seem particularly relevant:

▶ "To a great extent the ultimate outcome for the stressed individual will depend upon the adequacy of his techniques for dealing with the resistances or obstacles to adequate performance. For example, all pilots will feel some degree of heightened tension during the time that they are executing the procedures of an ILS approach, but this stress will be most likely to impair the performance of the pilot with the least adequate preparation and, because of the cumulative effects as we noted above, the degree to which stress will impair the performance of the poorly prepared pilot will increase in excess of direct proportion to the inadequacy of training. Likewise the adequately prepared pilot may show an increase in effectiveness as the situation becomes more critical and demanding because of the manner in which his performance from moment to moment reduces the moment-to-moment increments of resistance to the goal-oriented activity of breaking through in alignment with the runway. The subjective feelings of 'being under pressure' may initially be quite similar in all pilots, as say, they start their orientation procedure.

▶ "Stress is produced whenever a person feels that his repertoire of appropriate action is insufficient to meet the situation.

▶ "In summary we may say that when the pilot has, and recognizes that he has, all the necessary skills to cope with the situation that may arise he is less likely to be under stress. It is, obviously, the responsibility of the training program to provide the pilot with necessary skills and a recognition of his mastery of, and limitations in, the use of those skills.

▶ "To summarize the relation of training to stress prevention it seems necessary to say that training is the most relevant variable in dealing with the effects of stress. Some form of guided experience, whether designed to give the person manipulative skills, knowledge, or an appropriate orientation or outlook upon his training, seems most important in alleviating conditions of stress. Training or guided experience may furnish techniques and provide adaptation through which stress may be overcome once it is experienced." (Emphasis Supplied)

▶ "A wide range of stress reactions may be observed by enabling the observer to ride frequently on flight proficiency checks, either in military or commercial operations. Proficiency checks involve many real threats and difficulties for the pilot or air crew member being evaluated. They provide that compromise between stress and lack of real danger that should maximize the objectivity of the psychologist's observation."

Finally, the relationship between age and psycho-motor abilities and skills has been studied for many years. In a review of the literature, one is again impressed with the emphasis given individual differences. A typical observation is the following one by Dr. Wayne Dennis:

"Individual differences at each age are as great for psycho-motor activities as for any other type of behavior. In speed or strength or any other aspect of motor skills, there is overlapping even between 20-year-olds and 70-year-olds. Age alone, therefore, reveals little concerning a particular person's psycho-motor skills.

"With respect to age and vocational fitness, we must conclude, in regard to psycho-motor skill as we have in regard to aspects of human behavior previously discussed, that while age changes in performance can be expected for a particular individual, we cannot at the present time predict what this age change will be. In reaching a decision concerning particular cases, our present knowledge is of little value."

Therefore, when the retention or elimination of pilots can be based upon an actual demonstration of their ability to satisfactorily perform their job, it is very difficult to justify a proposal which would disregard concrete and tangible demonstrations of performance and substitute the almost universally recognized fallacies involved in the precise and arbitrary correlation of performance with chronological age for specific individuals.

On-The-Job vs. Theoretical Evaluation

The obvious advantages of on-the-job competency evaluation as contrasted to theoretical or laboratory testing have been recognized for many years. In the middle 1940's, the Civil Aeronautics Administration authorized a grant of funds to underwrite studies for the development of adequate testing procedures to evaluate pilot abilities in order to make the proficiency testing of pilots as objective as possible. Under this grant, a survey was conducted in 1946-47 by the American Institute for Research under the auspices of the National Research Council Commitee on Aviation Psychology. This survey was designed to reveal the critical requirements of the air line pilot's job, with particular reference to those aspects of pilot performance which might contribute to accidents during flight, and to develop practical procedures for the upgrading, selection, and certification of air line pilots.

As a result of the initial investigation, two subsequent studies were also sponsored and financed by the Civil Aeronautics Administration. They were again under the direction of the American Institute for Research and sought the development of objective testing programs for the evaluation of pilots in obtaining air transport ratings and in the conduct of semiannual instrument checks. These CAA projects directed the attention of the entire industry to the necessity of having proper testing tools and procedures for evaluating pilot proficiency. They recognized that a practical demonstration under properly established flight test procedures provides the prime criteria for determining pilot proficiency.

Dr. Ross A. McFarland affirmed these general concepts in a paper entitled "Psycho-Physiological Problems of Aging in Air Transport Pilots" presented before the 24th Annual Meeting of the Aero Medical Association in May 1953, when he stated, "The excellent safety record of the civil air lines is due to the fact that rigid flight tests are continuously applied by the scheduled air line operators. Although limited in precision and standardization from one company to another, the flight checks provide a truly functional test of a pilot's total performance."

What About Curve of Physical Decline?

It is asserted that the ability to resist fatigue and to maintain physical stamina begin to decline in early middle life and continue to decline at a fairly steady rate thereafter.

This is also much too general an observation to be applied to specific individuals. We believe that the question of fatigue has so many parameters and so many variables within those parameters that any attempt to equate it with a specific chronological age is hopelessly optimistic. When the variability of specific individuals is added to this complex, the selection of an arbitrary chronological age to be used as a licensing cut-off for all individuals becomes indefensibly capricious. It seems almost poetic justice that at the time this argument is being seriously advanced, the personification of the "ability to resist fatigue" and "maintain physical stamina" is 56-year-old Max Conrad who recently set a new nonstop distance record for small planes. He flew 7,688 miles solo in slightly over 58 hours and regularly ferries small planes to Europe, frequently nonstop and solo.

Assertions that "ability to learn declines with age" suffer from a lack of relevancy when correlated with one specific chronological age and then applied blanket fashion to all individuals.

This statement is well-documented in the literature, and we know of no study which does not contain a warning against the dangers inherent in applying this type of general observation to specific individuals in specific situations. Another aspect of this question was emphasized by Dennis when he noted that, "No one has yet attempted to measure age changes in technical and specialized knowledge within different occupational groups. If this were done, a consistent increase with age might be found."

Finally, we are also reminded of the rather obvious fact that many pilots over 60 have been flying competently for many years and that many pilots over age 55 have demonstrated their ability to acquire the necessary skills and knowledge to successfully transition to turbo-jet aircraft.

It is also asserted that there are distinct differences involved between piloting aircraft having turbo-jet engines and those having piston engines which are of such character and magnitude that they require licensing considerations above and beyond the successful completion of adequate transition training.

This contention is not consistent with the stated opinions of the manufacturers of these airplanes, the ALPA Aircraft Evaluation Committees who have flown them, the most experienced operators of the turbo-jet commercial aircraft, nor the pilots who are currently flying them.

Before one is carried away with the "difficulty of new techniques concept", it seems worth remembering that the introduction of instrument flying, pressurization, reversible propellers, new airfoil designs, higher wing loadings, and innumerable other innovations during the years have required the development of new techniques. For that matter, it is in the constant adaptation to such new devices and techniques that the pilot becomes expert. It is part of his routine to become expert in the processes necessary to adapt to new aircraft and to devices requiring "new techniques".

Finally, we should like to discuss the two related assertions that after age 55 the "likelihood of reverting to previously learned and well-established habit patterns" is so great that these pilots cannot be trusted to take appropriate action and that "new material is learned with difficulty and retained poorly when it requires the unlearning of previously acquired knowledge and skill."

Again, we believe there is no available evidence which supports the application of this type of generality to specific individuals who are required to demonstrate their ability to do the very thing which it is assumed that they cannot. The hard facts are simply that pilots over 55 have successfully transitioned to turbo-jet equipment, some of them in half the time of pilots 20 years younger, and that pilots over 55 actually demonstrated in periods of stress that they retain the necessary knowledge and skills to perform satisfactorily. Whether or not this involved the "unlearning of previously acquired knowledge and skills" or avoiding reversion to "previously learned and well-established habit patterns" is an academic question. Certainly that thesis has not been proved to date. What has been demonstrated is that many pilots over 55 have successfully transitioned to turbo-jet aircraft and that no problem that could possibly lead to a general conclusion has appeared.

What Is The Real Problem?

The proposed regulations do not squarely face one of the chief problems they are attempting to solve, i.e., that of potential pilot in-flight incapacitation.

Potential pilot incapacitation has been continuously recognized as an air safety problem from the beginning of commercial air transportation. It was one of the prime reasons for requiring the first copilot and was an important factor leading to the adoption of a copilot requirement for the S-58 helicopter.

Recent concern was evident when the Flight Safety Foundation, in its medical study for the CAA, included potential sudden incapacitation as one of the "four principle personal factors relating to medical qualifications". The following quotation is from that study:

"Potential Sudden Incapacitation. Cardio-vascular difficulties, especially coronary occlusions, continue to lead potential contributors to sudden incapacitation in the medical sense: Hypoglycemic drugs taken orally, such as Orinase, have been found helpful in the control of certain cases of Diabetes and perhaps have reduced but not eliminated the possibility of Hypoglycemia ((too little sugar in the blood): Acute abdominal or intestinal upset appear to predominate among acknowledged reasons for temporary incapacitation of pilots in flight."

For reasons not apparent to the Association, FAA concern seems limited to consideration of the more physiologically serious types of incapacitation (heart attacks, strokes, diabetes, etc.) for which it is possible to make a reasonably accurate medical assessment of probability. Very little, if any, attention has been given to evaluating the safety problem presented by those disabilities which are acute and/or not susceptible to an accurate medical assessment of probability. This is difficult for us to understand because we believe this type of incident causes the greatest number of pilot in-flight incapacitations on our scheduled air lines.

This conclusion is based primarily on a survey conducted among 13,500 members of the Air Line Pilots Association. 4,544 questionnaires were returned— 2,562 by Captains and 1,982 by Copilots. This represents almost 40 per cent of the nation's entire air line Captain force and approximately 20 per cent of the Copilot group; 1,552 cases of incapacitation sufficiently serious to be remembered were reported. While we do not have reliable frequency information regarding these incidents, it is impossible to make any sort of reasonable assumption regarding their distribution which does not clearly indicate a considerably greater frequency than is found with the more physiologically serious potential incapacitations to which concern is apparently being limited.

This conclusion can be reached by using ordinary common sense. It is only necessary to believe it reasonable to expect a pilot to have a greater number of abdominal or intestinal upsets than heart attacks in the course of his career. That such incidents can be incapacitating and have definite air safety ramifications was rather dramatically demonstrated shortly after our study was completed. In this instance, a transcontinental transport was forced to make an unscheduled emergency landing considerably short of destination because two of the three flight crew members were so severely disabled from food poisoning that they were taken to the hospital in an ambulance.

These studies have been available to the federal agencies since their completion. They are still available and we believe must be given serious consideration in any meaningful evaluation of the air safety ramifications of pilot in-flight incapacitation. It is impossible to deal realistically or effectively with this air safety problem if the largest category of causal factors is ignored.

There is still another reason indicating that the problem of in-flight incapacitation is not being squarely faced. Heart disease is not restricted to a specific age group. Research by Benson; Enos, Holmes, and Byer; Graybiel; Glantz and Stembridge; and others, has stressed not only its wide age variables, but also the high incidence of coronary sclerosis in young people.

If all parameters of the pilot incapacitation problem are considered, it becomes clear that no testing procedure or other remedy provides as much protection as a fail-safe crew, and that effective protection cannot be achieved without one. A fail-safe crew requires a fully qualified and trained copilot to take over if the pilot-in-command is incapacitated, or, as has happened, dies in-flight, and that other crew members be fully trained and qualified for all flight functions. (No scheduled air carrier cockpit deaths have occurred in which the pilot was over 55.) Only then can the remaining crew members function as a safe operating crew in either normal or emergency situations in the event that one of them is incapacitated.

Transition problems are not new to this industry. One has only to reflect on changes which have been made over the past 30 years to realize their magnitude and variety, and also to realize that the adaptability of the pilot has been a key ingredient in their successful solution.

Only 38 years ago, a small group of pilots proved that the mail could be carried at night with a historic transcontinental flight using strategically placed bonfires for directional beacons and to illuminate and identify landing fields. By the mid-thirties, instrument reliability and the art of instrument flying had progressed to the point where a degree of scheduled reliability previously only hoped for seemed attainable. This was the beginning of the end for "seat of the pants" flying. Instrument flying had become a primary skill and pilots were required to learn it "or else." It is not at all surprising that this was a period of major transition problems. Senior pilots on some of our oldest air lines still refer to it as the time of the "purge" because several of their group were unable to adapt to this technological change. Many of them had reached the middle or later portions of their third decade and sincere and interested observers wondered if the industry was encountering a pilot age problem because flying was so obviously "a young man's game."

This sort of thing has not been an isolated incident in the careers of the men who would be directly affected by these proposals. The story of their careers is the story of an almost continuous succession of changes and innovations in equipment, techniques, and procedures, and either their successful adaptation to changing conditions or their elimination. Airplanes went from 40-B's, Ford Trimotors, and Curtiss Condors to Lockheed Lodestars, Electras and DC-2's and DC-3's. The outbreak of World War II stimulated research and development, and pilot flexibility and adaptability were demonstrated when approximately ½ of all air line pilots were called into the Armed Services and served with distinction in all theaters and on all types of missions. They flew everything from heavy bombers to the latest fighters.

After the war, the four engine DC-4's were followed by the first pressurized commercial transports—the Constellation and DC-6 and DC-7 series, with speeds approximately double and gross weights quadruple those in common use a short time before.

The same story is true of navigational techniques and procedures, for here the transition was from "seat of the pants" flying to elementary instruments, from the early four-course low frequency ranges to ADF's, VAR's, VOR's ILS, GCA, and OMNI. Deicing boots, tricycle gears, heated wings, reversible propellers, electronic engine analyzers, and weather radar have all been innovations, some requiring considerable modification of previously acquired techniques and knowledge.

Still another change has been in basic weather minimum which have been lowered from ceilings of 600' or 800' with visibilities of 2 miles to our present 200' ceilings and one-half mile visibilities. This has been accomplished in a continuing succession of faster, heavier aircraft which were often also less maneuverable than their predecessors.

As might be expected with any group, which is required to pass rigid periodic proficiency checks, this continuing march to technological and operational progress also took its human toll of those who were unable to continue to advance with their profession. As has been noted earlier, there are many reasons that air line pilots cease flying. Failure successfully to transition is one of them. It has been part of this industry since its inception. In an intensely competitive industry which epitomizes rapid technological progress, it is not surprising that there have been, and will continue to be individuals who are unable to keep up.

Few transition periods have been accompanied by the drama and publicity which have accompained our entry into the commercial jet era. In this atmosphere, it is not surprising that some problems have not been viewed with perspective or that quotations by prominent people which have appeared in the press have sometimes been misleading. These stories have alleged, among other things, that "strict union procedures" have forced the check-out of incompetent pilots on our jets. This most serious charge, however, is not supported by an investigation of the fact. Instead, it and similar statements are based on a series of misconceptions, misinformation, and so gross a lack of familiarity with the actual conditions and problems as to suggest that a major educational effort might be an extremely constructive step toward achieving greater air safety.

For, example, it is a fundamental premise of this Association that maintenance of high physical and professional standards is an inherent part of an air line pilot's career. A pilot who cannot meet proficiency and health standards should leave the cockpit (and does under existing procedures), whether he is 35, 45, or any other age. If there are isolated instances where this has not happened, it is because the individuals who have been given the responsibility of enforcing standards by the Administrator are not doing their jobs. It should not be necessary to state that there are more fruitful areas for the correction of this type of situation than the imposition of an arbitrary chronological retirement age.

There Are Ample Existing Screening Procedures

Every pilot flying in jets or any other aircraft has been examined and certified by both his company and the Federal Aviation Agency. Agreements between companies and their pilots require only that the senior men be given an opportunity to qualify on new airplanes if they desire to do so. If they are unable to qualify, they suffer the consequences. It is that simple.

A review of pilot discharge cases on the scheduled air lines quickly and clearly reveals that discharge for either physical or technical competency are rarely appealed and that in those cases where an appeal is made by the affected pilot, his position is rarely upheld. For example, in the five year period from 1955 to date, 82 pilot discharge cases were formally appealed to the Adjustment Boards which are provided by agreement between the carriers and their pilots. Thirty-two of them involved technical competency and 4 involved physical competency. The pilot was not upheld in any of the cases involving physical competency, and was upheld in only 5 of the technical competency cases (6 are still pending). These 5 decisions did not rule on the pilot's competency per se, but only on the question of whether or not the pilot in question had been given a fair and reasonable opportunity to demonstrate his competency. The 32 technical competency cases can be further subdivided as follows:

- Failure to upgrade (12)
- Failure to successfully transition (5)
- Failure to pass periodic competency checks (10)
- Unsatisfactory performance and progress as copilot (5)

Learning Is Peculiar To The Individual

The FAA voices concern over the learning ability of older pilots in this proposal. Present experience indicates that problems associated with transition to jet aircraft will differ little from those generated in past transition periods. As would be expected, the training time necessary for transition to the jet has varied widely with individual pilots. These variations have been of the same order as is found in nearly all qualitative evaluations of the psycho-motor or mental skills of any large group of individuals. This phenomena of individual variability is so well documented and universally accepted as to have become virtually axiomatic.

As a result of increased research and knowledge, the assumption that older persons have unusual difficulty learning new skills or techniques is being increasingly questioned by serious students. Longitudinal studies of the same persons at different ages have not revealed the expected decrease in mental capacity. Investigation has revealed that, "The so-called decline in intelligence does not seem to be evident when the same individuals are retested after ten, twen-

ty, or thirty years." (Lorge, Irving, Dr.—"Intelligence and Learning," Aging, A Current Appraisal—Sixth Annual Southern Conf. Gerontology.)

Dr. Ross McFarland has observed, "The more complex a function becomes psychologically, i.e., the more it depends on experience, judgment and reasoning, the more resistant it is to deterioration with age. . . . Apparently the brain, like other organs of the body, shows continuous improvement over the life span if appropriately 'exercised'." (McFarland, R. A.—The Psychological Aspects of Aging, Bulletin of the New York Academy of Medicine, January, 1956, pages 14-32.)

Finally, one should always remember that the individual pilots who have survived the continuing processes of elimination which is an inherent part of their profession comprise a highly select group for purposes of their job, in terms of motivation, competency, and physical condition. Any attempt to equate them with the general public in areas which are influenced by this selectivity must be seriously questioned. And, of course, the entire assumption falls when any attempt is made to apply it to an individual. Many individuals at extremely advanced ages demonstrate phenomenal physical and mental agility (Senator Green, Congressman Cannon, Albert Einstein, Satchell Page, Archie Moore). Many pilots currently transitioning to jets have accomplished such transition in half the time of pilots twenty years younger.

While air line pilots specifically and pilots generally age 60 and over have been flying for many years, the numbers have not been sufficient to draw completely valid conclusions as to any problems which may appear. This subject has been covered elsewhere in this statement. The Association, therefore, looked to comparable industries for information and was naturally led to the railroad industry which has had considerable experience with the utilization of older people in the positions of railroad engineer, firemen, and so forth, operating high-speed trains and assuming great responsibility for life and property. These studies revealed the following:

- The federal government has never promulgated any compulsory retirement age for operating personnel of the nation's railroad system.
- The railroad industry depends upon physical examinations and competency to determine the health and efficiency of its operating personnel.
- Any retirement ages which have been established for operating personnel have been concluded by collective bargaining under the provisions of the Railway Labor Act.
- In 1957, the average retirement age of road engineers and motormen was 67.5 years. Only two out of the 128 existing job classifications listed by the Railroad Retirement Board had higher average retirement ages. We believe that this is attributable to the fact that these individuals are subject to regular physical examinations which prolong their health and efficiency.
- Our study also demonstrated that the percentage of retirement based on disability for the road engineer and motormen is 11.2% which rank them 117 in a list of 128 job catagories so that, despite the fact that these individuals had the third highest average retirement age and more stringent physical qualifications, the engineers demonstrated that chronological age has very little, if anything, to do with the functional ability to satisfactorily perform one's job.
- In 1956, the average age of the engineer group in railroad employment was 59. Of this group, the fastest trains are operated by the senior members. Our examination of the safety statistics in the railroad industry disproves the popular misconception that large numbers of railroad accidents are caused by "these old engineers." This is completely an old wives' tale. The senior engineers in the railroad industry have been operating the fastest express trains of our nation's railroads with an exemplary safety record.

Our studies indicate that the railroad industry has been subject to a considerable amount of misinformation, rumor, and propaganda concerning the utilization of older employees in its work force, especially in the operation of fast trains. Objective studies will show that this has been a completely conservative and intelligent practice and that there has been no effort by the Congress or any government agency to alter it.

The tendency for some people in the air line industry is to view the air line pilot as a "young and intrepid birdman of exceptional daring and endurance." We believe that the traveling public would prefer to ride aircraft which are piloted by mature individuals of exceptional conservatism.

As indicated previously in this statement, accident statistics in aviation generally, and in the air line industry specifically, do not support any conclusion of reduced safety with the age of the pilot. The longer history of the railroad industry also fails to support such a conclusion.

No Precedent For FAA Action

We have searched diligently in an effort to locate any precedent for the action proposed by the Administrator. As far as we can determine, these proposals are completely unique and without precedent in the legislative or administrative history of this country. Neither the Congress nor any agency of the federal government has ever established a compulsory chronological retirement age for any position, any profession, or any job classification along the lines proposed by the Administrator.

The federal government and its agencies have legislated and promulgated rules and regulations covering many occupations which involve hazard and in which the employees bear a large responsibility for life, property, and public safety, but in no such case has a chronological compulsory retirement age been imposed. We cite, for example, railroad engineers and firemen and the drivers of large over-the-road trucks. In both of these occupations, these individuals bear a large responsibility for life and property but no compulsory retirement age has been proposed.

Other individuals bearing very serious responsibility, such as sea captains in the Merchant Marine, electrical linemen, Members of Congress, and, for that matter, the President and the members of the President's Cabinet, are not denied the privilege of pursuing their profession or occupation by the imposition of a chronological retirement age.

A doctor is not denied the privilege of performing delicate operations or practicing his profession in any way at any age. The lawyer or teacher is not requested to surrender his license to practice his profession. Pilots, other than air line pilots may fly as long as they can meet physical standards less than those established for air line pilots and may occupy the same airspace as air line aircraft. Only the air line pilot, and he, regardless of competency and physical condition, is to be singled out and his professional life arbitrarily terminated.

The proposal of the Administrator is, in our view, contrary to the policy of many other departments of our federal government. The Congress, of course, has adamantly refused to establish a compulsory retirement age for any purpose, and this Association is in receipt of considerable correspondence from Senators and Congressmen indicating that, in their view, the proposal of the Administrator is unsound and contrary to public policy. The Department of Labor has conducted many studies in recent years and published their findings indicating that the older worker is a safe and valuable employee and encouraging industry to make all possible use of the older employee. These studies are consistent with the findings of many other organizations in our society who are attempting to adapt our overall working forces to the increased longevity and improved health of our population.

The Administrator is plainly at odds with the overall philosophy of our government and other agencies and with the advanced studies being made on this subject. There is no precedent for the proposed action because wherever and whenever it has been considered, it has been discarded as illogical and inequitable.

In summary:

- The proposed Regulations would impose a limitation on existent Airman's Certificates which cuts down the pilot's professional and property rights.
- The Administrator's action attempts to by-pass the procedures required under the Act by which a full evidentiary hearing must be held.
- The Administrator is without power to promulgate the proposed Regulations and his actions are violative of the due processes of law.
- The Administrator's action would impair existing Pilots' Employment Agreements and constitutes an attempted intrusion into areas governed by the Railway Labor Act. Such areas are not available to this Agency for regulation.
- The proposed Regulations constitute arbitrary action unrelated to safety purposes and based on incomplete and inadequate information.
- The Regulations proposed would serve no safety purpose. No incident or accident in commercial air line transportation has ever been attributed to the chronological age of an air line pilot even though pilots 60 years of age and over have been flying on the commercial air lines for many years.

From 1946 to January 1, 1959, there were 87 aircraft accidents involving commercial air liners, according to the CAB. Twenty-seven of the accidents were attributed by the CAB to the commanding pilot. In these mishaps, one captain was in his 20's, 16 were in their 30's, nine were in their 40's, and the eldest was 50. From 1946 to the present, the CAB reported that there have been only two fatal air liner accidents involving captain-pilots 50 years of age or older. No incident or accident has been attributed to the age or physical breakdown of the pilot, and no pilot over 55 has ever died in flight.

- The proposed Regulations will not provide any additional protection against incapacitation of flight crews. Incapacitation as the result of heart and circulatory problems, indigestion, diarrhea,

etc., will continue to occur, and the only positive protection for the public is for the Administrator to require a "fail-safe" crew. The proposed Regulations will only delude the public on this point.

▶ There is no necessity for this indefinite, inexact "meat ax" method of rule making when precise, proven methods of measuring physical fitness and competency exist and have provided satisfactory levels of competency and physical fitness for many years.

▶ Neither the Congress nor any agency of the federal government has ever promulgated a maximum age for any profession or occupation. Such an action has been recognized as being opposed to public policy. As a matter of fact, the Labor Department and other agencies of government have recently conducted exhaustive studies demonstrating, justifying, and encouraging the utilization by industry of older employees.

▶ The proposed rule is discriminatory in singling out air line pilots as distinguished from other pilots and other occupations and in arbitrarily depriving them of their profession regardless of their physical fitness or competency.

▶ The arguments advanced in support of the proposed rules do not have a basis in accepted research. The Administrator relies on general assertions regarding increasing physical problems with age and declining ability to learn. Every study on this subject indicates the inaccuracy of applying such general premises to a specific group and the complete inability to apply them to a specific individual.

▶ Both the Administrator and individual air carriers have adequate remedies available to them in existing methods of determining physical standards and competency for individual pilots and removing them from service without the adoption of any such inadequate measures as have been proposed.

The proposed rules should not be adopted. In any event, no action by the Administrator to adopt the proposed Regulations may be taken without a full public and evidentiary hearing.

THE BRIEFING

A Digest Of News And Views In Aviation

ALPA Comments on Copilot Proficiency Rating Proposal

Comments on the Federal Aviation Agency's proposals for closer check on air carrier training programs and type ratings and six-month proficiency checks for co-pilots are now in the hands of the FAA. Deadline was September 21.

An analysis of the comments, reveals as expected, that the two major interested parties, ALPA and ATA, have taken diametrically opposed positions.

From ALPA's standpoint, not only should the proposed regulations be adopted, but they should go even further and be bolstered by modifications and additions which would strengthen them.

From ATA's standpoint, the proposals should be rejected and they cite increased economic costs as justification of their position.

In addition to supporting adoption of the proposals ALPA recommended modifications and changes which, it said, would originally insure uniform interpretation of CAR training requirements in setting up training programs and subsequent monitoring and compliance in maintaining them. It also recommended creation of an Air Line Transport Copilot License, which, it maintained, would result in establishing specific standards for copilots and thereby re-enforce the FAA's proposals.

Noting that a demonstrated need existed in both areas, the Association said neither the adoption of the proposals as written, nor the inclusion of ALPA recommendations would impose hardship on carriers with adequate training programs but would only force those with inadequate programs to elevate their standards.

Regarding trainings, the Association recommended rules which would: (1) Assure that a *minimum* standard of competency is being maintained by constant FAA approval and monitoring training programs; (2) Assure that proficiency will be *maintained* or *improved* by frequent refresher training; (3) Assure that the essential elements deemed necessary for training by the manufacturer *will not* be deleted from the program; (4) Assure a fail-safe crew concept by requiring certain minimum knowledge by *all* crews members; (5) Assure that proficiency in emergency procedures is maintained by scheduling pilots for *regular* periods of emergency training; (6) Assure that the *same* high level of competency in the training program is required for *all* types of aircraft flown by the carrier; and (7) Assure that the program of training does not contain unnecessary detail but is designed for the purpose of *increasing* the pilots' competency in the airplane.

For experience requirements to obtain and maintain the ALPA-recommended Air Line Transport Copilot License, it was recommended: (1) That the minimum experience requirements for an individual to qualify for examination for such Air Line Transport Copilot License shall be at least 1,000 hours experience of dual and solo flying as a pilot if acquired in aircraft of less than 12,500 pounds, or at least 750 hours of dual and solo flying experience if 500 of such hours are acquired in aircraft in excess of 12,500 pounds; (2) To comply with these provisions, an airman, possessing a commercial pilot's license and an instrument rating and serving in a flight crew member capacity other than first or second in command may log not to exceed 50 per cent of his flight time toward the minimum 1,000 hour requirement for the Air Line Transport Copilot Rating; (3) That an individual serving as second in command on an air line transport aircraft shall possess a current type rating on the aircraft on which he is serving and must undergo periodic proficiency checks to maintain such rating on a current basis.

Recommendations relatively similar to the proposals now under discussion were made by ALPA as early as 1956.

(Continued from Page 15)

correct frequencies installed. A GCA approach was made with the weather indicating 500 ft., two miles visibility and haze. One pull-out had to be made and the second approach was successful.

In comparing the workmanship throughout the TU 114, I would say it was comparable to much of our present equipment.

"daw Zveedanya" Captain

Captain Yakimov had a good natured personality and a sharp wit. I inquired how long he had been flying. He laughed and said he had been tripping over his "borodo" (beard) for some years. He has been flying for 25 years and has flown all types of equipment. He started out in "streeblee" fighters. He was very familiar with the TU 114 cockpit.

He informed me that air line pilots for Aeroflot are recruited from various Aero Clubs located throughout Russia. The pilots learn to fly in their spare time in between regular working hours. One hundred fifty hours flying time is the minimum requirement prior to air line acceptance. Pilots are graduated from reciprocating equipment into jet equipment as supply and demand requires. Captain Yakimov was a good host and answered all our queries.

We finally had to wish Captain Yakimov "daw zveedanya" (good bye) many happy landings and a good flight home, so ending our visit to the TU 114.

TORNADO

By Ed Farthing
TWA Meteorologist

(The cry "Tornado" is a deadly, fearsome sound. It sent people to the storm cellars 100 years ago and it still does. However, much has been learned about the habits of tornadoes and how to forecast them. The danger is still there, but in general people today aren't caught as unprepared. This and other facts of interest on tornadoes are found in the following article originally published in FLITE FACTS.)

ON March 18, 1925, at approximately 1:00 P.M., a tornado formed in the western part of Missouri, which, before it was over, was to go on record as the most destructive so far known in the United States. By the time it had dissipated sixteen miles east-northeast of Princeton, Ind., at 4:18 P.M., 689 persons lay dead, and 1,980 others were injured. Property damage was placed at $16,632,000, and this was based on the value of the 1925 dollar. This single tornado traveled a total distance of 219 miles, with a path of destruction varying from one-half to one mile in width. Its forward speed varied from 57 to 68 miles per hour.

Four towns were practically obliterated. Two hundred and thirty-four persons were killed at Murphysboro, Ill., and another 800 were injured. Seventy per cent of the residential district and 60 per cent of the entire city were reduced to rubble. Thirty-four persons were killed in Griffin, Ind., and when the storm moved onward, not a single habitable structure remained in the town. West Frankfort, Ill., was also hard hit. Nine hundred and twenty-five homes were damaged or destroyed and 3,000 people were left homeless. West Frankfort counted 127 dead and 450 injured, of which 117 required hopsital care.

Apparently, **no one ever thought of sounding an alarm or warning other communities!**

Warning Network

It is doubtful that such a disaster could befall us today—not the tornado or the destruction, but the terrific loss of life. We have come a long way since 1925. With the advances in tornado forecasting, the U.S. Weather Bureau warning networks, tracking by radar, and improved communications, most of the populace are forewarned and can take shelter. Buildings still will be destroyed and property lost, but the loss of life can be and has been greatly reduced.

Although tornadoes have occurred in every state, during every month and at every hour of the day, they do have certain characteristics and probability patterns which should be known and recognized by all.

A Parasite

First, a tornado is a parasite and occurs only in conjunction with thunderstorms. They are most often associated with the violent squall-lines which approach from a westerly direction in the early evening hours, but have been known to form from single thunderstorm clouds. On June 27, 1955,

13 tornadoes developed from a single cumulonimbus cloud which moved down the North Platte Valley in Scottsbluff County, Neb., between 1:00 and 3:30 P.M. local time.

As a matter of interest, this tornado situation was undoubtedly the most photographed in history. Ninty black and white photos, 35 color slides, and 10 movies are known to have been made. This was also apparently, the first time the roar of a tornado was ever broadcast to radio listeners. Radio station KNEB dispatched a mobile unit to follow the storm and warn residents of its path. The unit's operators, trapped in a cemetary, took refuge in the basement of a caretaker's building, leaving their station wagon with the equipment still operating. The storm passed directly over the unit, leaving it badly damaged but still operating.

Occurrence

Tornadoes occur in all states, but there is a clearly defined maximum through the Middle-West. This maximum extends from Northeast Oklahoma through Central and Eastern Kansas and the extreme western edge of Missouri, into Eastern Nebraska and Western Iowa, northward to about the Iowa-Minnesota border. In this area, 15 or more tornadoes were reported per 50-mile square during the 30-year period, 1920-1949. By state and area, researchers have placed the ten highest in the following order: Iowa, Kansas, Arkansas, Oklahoma, Mississippi, Alabama, Missouri, Indiana, Illinois, and Ohio.

As a whole, tornadoes are most frequent during May and June, but the area of maximum occurrence exhibits a distinct progression with the seasons. From October through February, this maximum is, in general, over the Southeastern States, from Eastern Oklahoma to Georgia and parts of Florida. Moving slightly to the north and west in March, by April it extends from, roughly, East Central Texas through Eastern Oklahoma and Arkansas into Southwestern Missouri and Southeastern Kansas. By May the area of maximum occurrence covers Northeastern Oklahoma, Eastern Kansas and Nebraska, Western Missouri, and most of Iowa. June shows little change over May except that, in general, the area of maximum occurrence progresses northward some 100 to 200 miles. For the remainder of the year, the maximum is centered over Iowa.

From 4:00 P.M. to midnight has been shown to be the time of greatest frequency, with 59 per cent of all known tornadoes reported during this period. Midnight to 6:00 A.M. accounts for 10 per cent, 6:00 A.M. to noon 8 per cent, and noon to 4:00 P.M. 23 per cent.

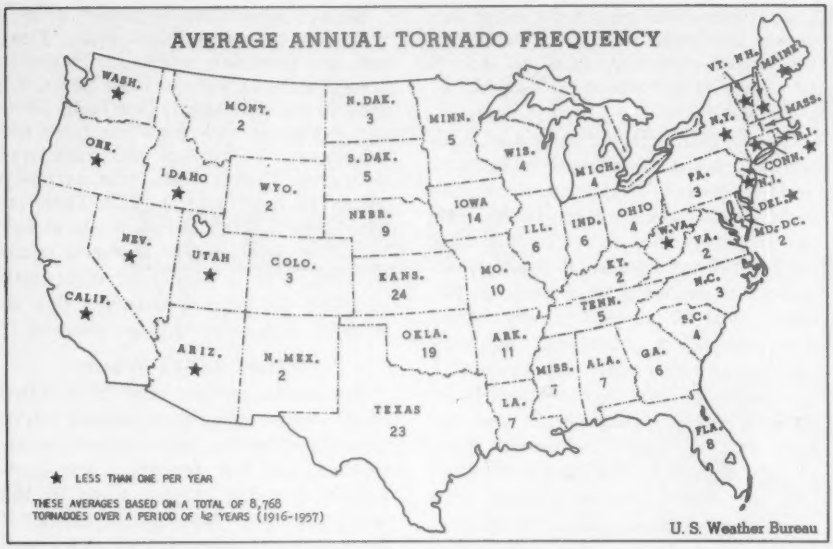
In general, lightning associated with tornadic activity seems to be brighter and of greater frequency than with ordinary thunderstorm conditions. Various observers have described this lightning in different ways: "Brighter, bluer, and more vicious than those from any other type of storm." "Very bright sheet lightning, interlaced lightning way up in the clouds like lacework." "Continuous sheet lightning with interlaced effect." "The whole west and northwest sky was a continuous blaze of light. Intensely vivid flashes of forked lightning were frequent, being outlined in green, blue, purple, and bright yellow colors against the dull yellow background of the never ceasing sheet lightning." One must conclude that lightning may at least sometimes provide a visual indication of possible tornadic activity.

Many cities have reported several tornadoes over a period of years. They can and do strike twice. The town of Irving Kan., experienced two tornadoes only 45 minutes apart. One came from the southwest and the other from the northwest. A third of the town was destroyed. Codell, Kan., was narrowly missed by a tornado in 1915. Then, on May 20th in all instances, it was struck in 1916, again in 1917, and still again in 1918. For a long time afterward, you can be assured that the day of May 20, was a day of grave concern.

Nature At It's Worst

Tornadoes are the most destructive of all storms. They have wrecked trains, demolished homes, water towers, automobiles, and left forested areas completely denuded. Actual force of the wind has never been measured—wind instruments disappear along with everything else. Estimates based on damage range from 200 mph up to 500 mph or more. In addition, lowering of pressure within the funnel often causes buildings to literally explode, with the

Tornadoes like this claim scores of lives and cause millions of dollars in damage.



roof lifting upward and all four walls falling outward.

What causes these violent storms? In actuality, no one knows. We know the weather situations with which they develop, and can forecast an area of probable development with reasonable accuracy. However, the actual mechanics of the storm are still a question of theory. It is generally accepted that the whirl is initiated in a downdraft of cold air from a parent cell within the thunderstorm. This feature, as well as that of suddenly lowered pressure, was described by the radio operators who took shelter during the Scottsbluff tornadoes previously mentioned.

"The windows were sucked out of the basement by the vacuum created by the storm, and it became very hard to breathe at the height of the storm. We could hear the havoc being created by it—trees and tombstones crashing near us; and, during the height of the storm, digging tools such as shovels, axes, etc., were sucked out of a cabinet at the bottom of the entrance to the basement and whisked up and out of the entrance like straws. The temperature during this time dropped very noticeably, and an afternoon that had been very warm suddenly became quite cold."

What To Do

What should we do? What precautions can be taken? On the ground, the best refuge is in a well-constructed basement of a frame house. As most tornadoes move from the southwest, the southwest corner is best. If known to be approaching from another direction, the wall or corner in the direction from which the tornado is approaching offers the safest cover. The basement of a brick or stone house can be a death trap. Collapsing walls often drop tons of stone and brick upon persons beneath, with fatal consequences.

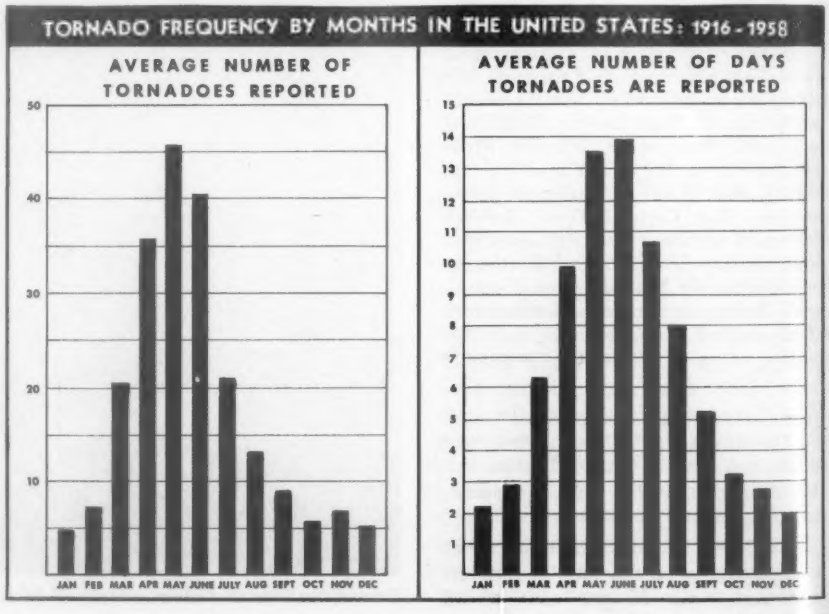
Don't stand in the open. Flying debris is lethal. If caught in the open, a ditch, culvert, or low depression can be used. Lie face down and cover your head with your hands. Windows and doors on the lee side of houses should be opened. This helps equalize the rapid pressure changes and may keep your home from being blown apart.

If in the air, flying in the clear underneath and in daylight, a tornado can be seen and avoided. However, flight below about 10,000 feet above ground should be avoided on instruments or at night if tornado activity is forecast or suspected. Evidence to date indicates that the true tornado funnel never extends to higher than about 10,000 feet above ground and is usually much shorter. It may be pretty rough up above, but still better than flying blindly into a funnel itself. If you cannot remain in the clear above or away from all cloudiness, the safest course is to land at the nearest usable airport and wait for the "all clear".

Plenty Of Horsepower

Never underestimate the power of a tornado! Planks have been driven through trees and even through steel beams. Straws and grass are often driven into trees and other wooden surfaces. In one case a tornado lifted an 80-ton baggage car directly upward from its coupling with the engine and hurled it 80 feet away. The coupling was still locked, unsprung and unbroken.

It is hoped you never experience a tornado. If you do, perhaps you can be as fortunate as a farmer in Neosho County, Kan., on May 1, 1948. This farmer had just received $1,400.00 in down payment for the sale of his farm and had placed the money in a spare pair of pants. With the approach of the tornado, he and his wife ran for the basement and were uninjured. Along with other things, the pants and money disappeared. Afterwards, while cleaning out a cave nearby, they found: 1) a dead hog, 2) a pump, 3) a washing machine, and 4) most important of all, the pants with the money still in the pocket.



Pilots Form "Flying Highway Patrol"

Reprinted From The Great Silver Fleet News

Dade County Sheriff's Patrol Check Afternoon Flight Plans

"ABLE Eight to Operations. Car headed west on Tamiami Trail; estimated speed at 90 mph."

The small airplane banked and cut across the road to 400 feet flashing a badge that read "Dade County Sheriff's Air Patrol." The speeder slowed down immediately.

Deputy Sheriff John D. McBride, EAL pilot, was riding as observer in his own airplane on the Fourth of July over a section of Dade County just west of Miami. Flying the small craft was Jack Fast, Miami dress manufacturer and also a deputy sheriff.

These two, along with some thirty-three other men form the Sheriff's Air Patrol of Dade County, Florida. Although they are volunteers working on call as auxiliaries and using their own airplanes, they are regular, uniformed, commissioned deputy sheriffs with status equal to the paid deputies.

Other EALers Serve

Three other EALers belong to the Air Patrol: Captains Bufkin Fairchild and Curtis Pavey, and Pilot John Yandell, Jr. A cross section of the Dade County community fills out the roster, such as a Naval Reserve dentist, John Yandell, Sr., for a father-son team; a CAA inspector, Thomas Ray; a member of the EAL medical department, Dr. Groom. And there's a senior member, J. P. Huffman, who used to deliver milk to the Wright Brothers when they were still building bicycles!

Primary function of the Air Patrol is to effect their "Holiday Crackdown" program over the highways. The men watch especially for the guy who combines traffic weaving with speed on a busy highway. It takes just about two minutes to complete the reporting process and send a highway patrolman after him. Success of their methods can be measured by the single-fatality statistics (a pedestrian) for the unincorporated areas of Dade County over the past nineteen months.

Everglades Rescue Filmed

The patrolmen also include the beaches and the Everglades in their sphere of operations and are on standby for any emergency. They were busily filming a fake rescue for publicity purposes one day when a report came in that a man and two boys were lost in the Everglades. They fired up an airplane carrying an Everglades expert, movie camera, and plenty of film. Within an hour they had found the victims and called for their Air Boat Division; and by the end of the afternoon they had another successful rescue under their belts and a complete movie of the whole operation, which was later shown to Miami TV viewers.

The Air Patrol doesn't pretend to do its work alone. Guidance and gasoline money comes from Sheriff Thomas Kelly and his staff, which includes the Patrol's Special Liaison Officer, David Narrow. The Coast Guard and Marines are on a 24-hour standby with their ambulance-helicopters and other equipment.

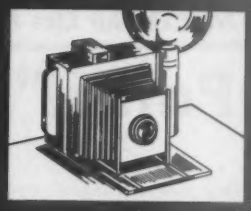
Plan Goodwill Tour of Cuba

Although the real work is done at Tamiami Airport and in the air, Commander McBride calls monthly meetings at the Courthouse to pass out assignments and plan for events such as their annual goodwill tour of Cuba as guests of the Cuban government.

The Air Patrolmen work hard to bring safety to their community, and they enjoy doing it. They're just proud

Pilot John McBride (EAL)

of their unique quality of being, as far as they can determine, the only voluntary air patrol composed of regular deputy sheriffs in the United States.



The ALPA Camera

Some Highlights and Sidelights of the News and ALPA in Pictures

Clark Luther, ALPA Vice-President Region III, presents Arthur E. Jenks, Chief of the Flight Inspection Division, FAA, with an honorary membership in the Association.

What? More Assessments!

Airport fire truck shown here is designed to operate in temperatures as low as 60 to 70 degrees below zero. It snuffs out fires with a blanket discharge of carbon dioxide.

Enforcing System Board Awards Which . . .

"...Shall Be Final and Binding"

ALPA Policy Generally Calls For Use Of Necessary Means To Require A Company To Abide By A Sound System Board Decision

By F. H. Bennett
Head, ALPA Legal Department

ALL System Board Agreements negotiated by the Air Line Pilots Association and its affiliate Associations carry the requirement that Awards of the System Board shall be "final and binding upon the parties." In recent months it has not been uncommon for a company to refuse to implement a System Board Award when it is favorable to the Association and the employee involved, whereas investigation discloses that in no instance has the Air Line Pilots Association, or any of its affiliate Associations questioned a System Board Award, however unsatisfactory it may have been regarded.

In refusing to comply with a System Board Award, a company will sometimes file suit to have the award set aside; in other instances the company simply refuses compliance which, in turn, requires the Association to act in seeking implementation. This action may take one or two avenues, i.e., the Association may sue in the courts asking a mandatory injunction to force the company to comply with the award, or the Association may resort to the strike process.

Nature of Award

In the interest of the public, to assure no interruption to commerce, System Boards and their functions are a requirement of the Railway Labor Act. These Boards are the forums for the arbitration of disputes which arise between the company and the class and craft covered by the Employment Agreement, when such disputes fall within the jurisdiction of the System Board. The awards of a Board are nothing more nor less than "contracts" between the parties which have been drawn by a common agent, and by which "contracts" both parties have agreed in advance to be bound. To say this in another way, the company and the Association have a contract (the Employment Agreement and the System Board Agreement) appointing the System Board as their common agent to render an award (contract) and both parties agree, in advance, to be bound by this award. Whether or not the award is subject to being set aside in a subsequent court action is, for the most part, governed by the same rules of law as those which govern the cancellation of a contract. It is conceivable that a contract is subject to recision for such reasons as fraud, or when it is unlawful, etc., so also is this true of a System Board Award. If a fraud has been perpetrated in its rendition or, if the System Board has exceeded its jurisdiction as such as defined in the System Board Agreement or, if the parties have not been afforded due process at the hearing before the Board out of which the award resulted, the award is subject to attack in the courts. Except for these narrow areas, however, System Board Awards are just as the parties have agreed, i.e., "final and binding."

Implementation of Awards

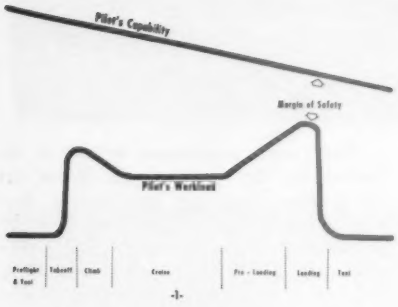
When a company refuses to give effect to a sound System Board Award, it is incumbent upon the Association to determine what course to pursue. Since failure to implement a sound award is a patent violation of a clear and unambiguous provision and requirement of the System Board Agreement, obviously such action of the Company justifies a strike. As we have seen, however, the Association can go to court. Strikes can be devastating, at least they are expensive to everyone involved; it would appear then that the more reasonable approach would be to take the matter to court. There are many reasons however why the Association is reluctant to accept the judiciary as the avenue for this relief. We set forth below only a few of these reasons.

The courts sometimes refuse to be bound by the rules of the game, in which case rights are lost forever. Recently, under a System Board Award a company restored an agent to employment after a wrongful discharge, but refused to satisfy that part of the award which required that the agent receive full back pay. The Association took the matter to court. The company did not allege any of the usual and necessary defenses which would permit the court to set the award aside or review it, yet the court did just that, heard additional evidence, and finally wrote a new and different award.

Failure to keep inviolate the company's agreements to regard sound system board awards as "final and binding" is an invitation to a court test of every System Board Award which is in any way distasteful to the company. Such procedure is inimical to sound labor relations and is precisely what the grievance processes and the System Boards are designed to avoid. Quick and final disposition of disputes are imperative, whereas litigation with its attendant uncertainties, motions, hearings, re-hearings, reconsiderations, appeals, cross-appeals, etc., keeps the employee on tenterhooks indefinitely, or worse, he is unable to wait out the law's delays and surrenders his rights.

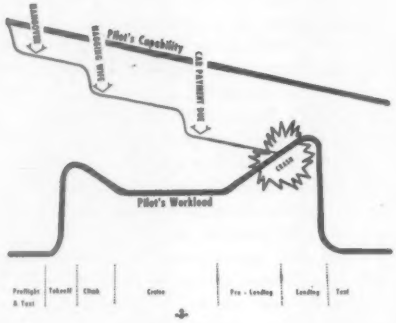
Except in some special circumstance which is confined to the individual case, it is the general policy of ALPA and its affiliates to use the means necessary to require a company to abide by its solemn contractual promise and obligation to regard a sound System Board award as "final and binding." Any other approach to this most vital problem is but a half-measure which in practice has proven to be completely inadequate.

A pilot' ability to cope with any flying situation varies with the workload caused by each phase of flight. Aviation induces stresses and strains involved in few other occupations. Flying demands constant vigilance and alertness; it imposes situations which leave small margin for error. The following diagrams graphically illustrate the varying margins of safety between a pilot's capability and the workload imposed during all phases of flight.

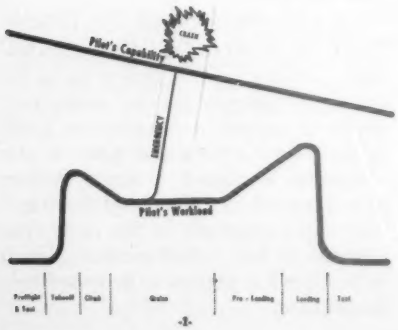


A pilot's capability is at the highest peak at the beginning of the flight. From there it assumes a constantly diminishing slope because of monotony, temperature, noise, hunger, and other fatigue factors. His capability is at the lowest point toward and during the termination of the flight.

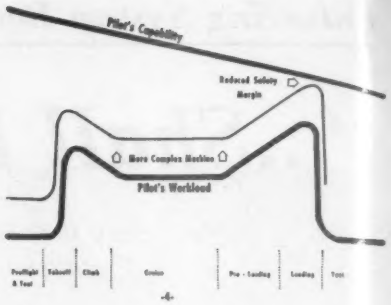
A pilot's workload is not a constant factor, varying with each phase of flight.



An inflight emergency can increase a pilot's workload to a point that exceeds his capability. When this occurs, an accident is usually the result.



Flying places pilots in a totally unnatural environment. It requires concentration to maintain a level of capability that will exceed the workload. Personal problems — hangovers, nagging wives, overdue car payment — taken into the air can reduce a pilot's capability below the workload. When this occurs, accidents sometimes happen.



Present-day demands for increased speed, maneuverability, and complete safety for commercial aircraft result in more complex machines. More complex machines increase the pilot's workload. With no increase in pilot capability, the margin of safety is reduced.

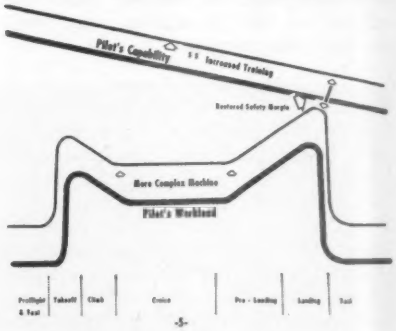
A Graphic Look at:

Pilot Capa

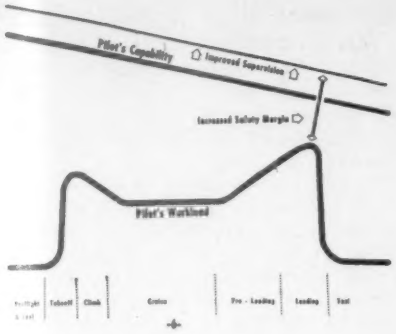
vs.

Workl Lo

Reprinted from United States Army Av



Increased workload and reduction in safety margin, caused by more complex aircraft, impose greater responsibilities for pilot training and supervision. The lost safety margin can only be restored through more thorough and comprehensive training to increase pilot capability.

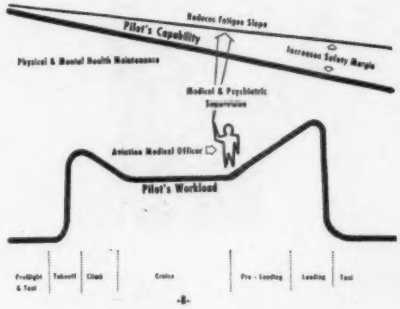


Higher pilot capability can only be maintained through improved supervision.

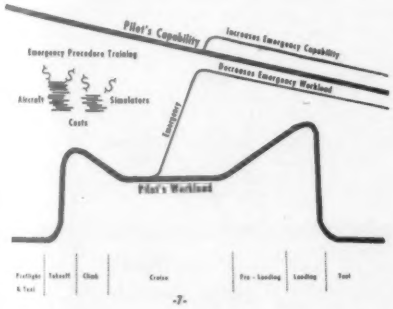
at:

Capability vs. Work Load

ited States Army Aviation Digest

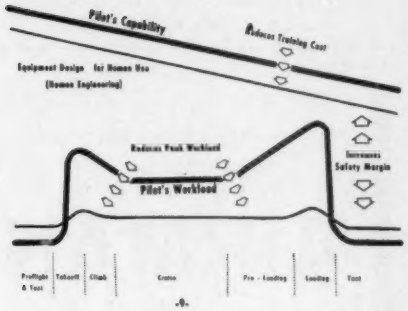


Pilot capability, greatly influenced by fatigue factors, can be improved through adequate physical and mental health maintenance.

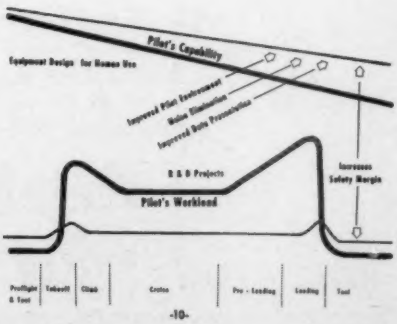


Ability to successfully cope with in-flight emergencies is attained through emergency procedure training. This training serves to decrease the emergency workload and increase emergency capability. The cost of this training can be reduced by flight simulators.

Human engineering in the design of new aircraft and improvement of present day aircraft can play a large part in reducing pilot workloads. Simplicity in design and ease of operation are the aims in this field. This can also serve to reduce training costs while increasing the safety margin.



Research and development projects, designed to improve pilot environment, eliminate noise, and improve data presentation are important factors in equipment designed for human use. Success in these projects will increase capability, reduce workload and increase the safety margin. In this direction can be found greater capability for the man-machine combinations which make up Commercial Aviation.



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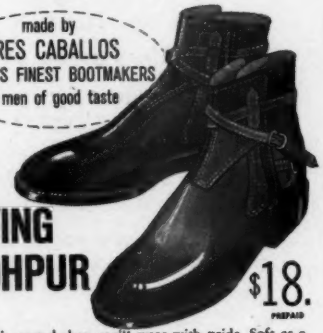

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...open a Philco-Bendix Self-Service Laundry Store

Many airlines pilots, co-pilots, engineers and stewards are going into the self-service, coin-operated laundry business. These new stores are made to order for absentee ownership and are hard to beat for fast returns on a small capital investment.

Here are some of the facts: A coin-operated laundry needs no attendant. Customers simply come into the store, wash and dry their clothes in metered machines and leave. Only a few hours a week are required to empty coin boxes and supervise efficient operation.

Why are they so successful? Philco-Bendix coin stores offer customers up to a 65% saving over attended-type wash-and-dry service. They are convenient for busy people because they remain open 24 hours a day, seven days a week. There are no credit problems—it's strictly a cash business.

Small initial investment! The overall cost of opening one of these coin stores equipped with Philco-Bendix Commercial Washers, *the only complete line of commercial washers engineered for coin use,* is surprisingly low. Only a small initial investment is required. The balance may be financed through Philco Finance Corporation. Return is so rapid that many investors amortize the total cost within a year.

Act now! Send coupon below for complete data on business locations in your area and valuable help in all phases of planning, financing and promoting a successful coin store.

PHILCO BENDIX **COMMERCIAL LAUNDRY SALES**

Philco-Bendix Commercial Laundry Equipment is brought to you by Philco Corporation

PHILCO CORPORATION
Commercial Laundry Adv. Dept. APS
Tioga and C Streets, Philadelphia 34, Pa.

Please send me information on Philco-Bendix Commercial Washers... also the name of my local distributor.

Name_____

Address_____

City_____ Zone____ State_____

$25,000.00

(CASH, TAX FREE)

Airline Pilot Occupational Disability Insurance*

Non-Cancellable To Age 60

(A group plan only — ask your ALPA chairman to contact us)

Pilot Groups Insured

- American Air Lines
- Bonanza Air Lines
- Braniff Airways
- Canadian Pacific Airlines
- Capital Airlines
- Caribbean Atlantic
- Continental Airlines
- Delta Air Lines
- Eastern Air Lines
- Frontier Airlines
- Hawaiian Airlines
- Mackey Airlines
- New York Airways
- Northeast Airlines
- Pan American-Grace Airways
- Piedmont Airlines
- Riddle Airlines
- Seaboard & Western Airlines
- Southern Airways
- Trans-Canada Air Lines
- Trans Caribbean Airways
- Trans-Texas Airways
- West Coast Airlines
- Western Airlines

Did You Know!

- This is the first group plan of its type in the United States and Canada (now in 8th year).
- This is the only plan non-cancellable to age 60.
- This is the only plan that will cover a pilot who loses his job for physical reasons, but retains his license.
- There has never been a rate increase.
- No claim has ever been denied.
- This is the only plan where all policy holders pay their premiums by payroll deductions.
- This plan will pay a co-pilot who is permanently prevented from being promoted to captain for physical reasons even if he is able to continue flying as a co-pilot.
- This plan will pay a Captain if he is permanently prevented from flying as a Captain for physical reasons even if he is able to continue flying as a co-pilot.
- There is a separate supplemental plan providing an additional $25,000 coverage.

This group plan will pay a pilot $25,000 cash, tax free, if he is permanently prevented from flying for his airline for physical reasons.

If your airline is already insured and you have been employed less than two years you are eligible without a physical examination.

If you have been employed more than two years and are under 36 you may join by taking our physical examination from your Company Medical Department or FAA Doctor.

- **UNITED STATES:**
  Aviation Insurance Agency, Inc.
  Atlanta Airport — Atlanta, Georgia
  CAPT. HARVEY W. WATT, Pres.

- **CANADA:**
  Aviation Insurance Agency (Canada) Ltd.
  P. O. Box 31, Islington, Ontario
  CAPT W. M. BENSON, Exec. V. P.

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